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ABSTRACT

Chicano and Amerindian vocabulary scale responses from the Stanford-Binet (LM) and Wechsler Intelligence Scale for Children were item-analyzed for 1,009 subjects. The response patterns differed both by ethnic group and test, as well as by age. The most common, and recurring, pattern found was "level-of-difficulty" gradient inconsistencies. The item-analysis method employed in this report was that of the covariance matrix where the sum of the matrix is the total-test's variance; vocabulary scale totals here, for both the SB-LM and the WISC. Tribes sampled were Navajo, Apache, and a group of subjects with mixed-tribal backgrounds designated "called Indian." Most of the protocols that could be analyzed on the vocabulary scales were pulled from the testing-course files at Arizona State University; other protocols were obtained from the reservations mentioned above. In the epilogue, based on the findings, it is suggested that bilingual programs similar to those being used in Texas' NIE funded program for the coming academic year be adopted for other large minority groups whose primary language is not either English or Spanish. (Author)

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FINAL REPORT

# Item Analyses of Amerindian and Chicano Responses on the Vocabulary Scales of the Stanford-Binet LM and Wechsler Batteries

National Institute of Education Project No.: 3-1955

Clark I. Guilliams

Missouri Southern State College
Joplin, Missouri

1975

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## Summary

Chicano and Amerindian vocabulary scale responses from the Stanford-Binet (LM) and Wechsler Intelligence Scale for Children were item-analysed for 1,009 subjects. The response patterns differed both by ethnic group and test, as well as by age. The most common, and reoccuring, pattern found was "level-of-difficulty" gradient inconsistencies. The item-analysis method employed in this report was that of the covariance matrix where the sum of the matrix is the total-test's variance; vocabulary scale totals here, for both the SB-LM and the WISC. Tribes sampled were Navajo, Apache and a group of Ss with mixed-tribal backgrounds designated "called Indian". Most of the protocols that could be analysed on the vocabulary scales were pulled from the testing-course files at Arizona State University; other protocols were obtained from the reservations mention above.

In the Epilogue, based of the findings, it is suggested that bilingual programs similar to those being used in Texas' NIE funded program for the coming academic year be adopted for other large minority groups whose primary language is not either English or Spanish (SEDL, 211 E. 7th St., Austin, Tex. 78701).

NATIONAL INSTITUTE OF EDUCATION
Grants for Research in Education--Small Grants

PROPOSAL TITLE: Item Analyses of Amerindian and Chicano Responses on the Vocabulary Scales of the Stanford-Binet LM and Wechsler Batteries

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## Introduction

Articles critical of the current role of standardized tests in our educational system are in mode currently; particularly, individual mental tests and the stigma attached to approximately forty million disadvantaged youngsters in the United States. However, this does nothing to stop the use of the Stanford-Binet LM or the Wechsler batteries by State Departments of Education for special screening and placement. Ballinger (1963) proposed the establishment of a national commission to examine the nature and use of standardized testing instruments, but a decade later, one sees that an IQ of 70 +/- 5 points, still is the criterion for special education placement, or is at least enough empirical evidence to award a youngster with the label, "retarded". Since there are no Nader Raiders to champion the cause for the culturally disadvantaged, nor a federal agency to police the policies and research practices (or lack of them) of the major testing companies--namely, Houghton Mifflin (SB-LM), Psych Corp (Wechsler batteries), and in higher education ETS (National Teachers Exam & Graduate Record Exam's) and Psych Corp (Miller Analogies)-the best that one can do is try to improve individual mental tests. Culture free tests and tests favoring one social group over another may not be even theoretically attainable and certainly will not be available in the near

future, and most certainly not if educational researchers sit back and criticize the weaknesses of tests waiting for a minor-miracle metamorphosis within the testing company domain.

Close scrutiny of the items on the major mental tests in the various subcultures of the country is a since qua non for the next revisions, but the NIE will have to have empirical proof that special scales can be constructed for special groups, and then demand that pilot standardization studies show conclusively that the culturally disadvantaged groups, most certainly bilingual populations, have not been raped in the verbal intelligence area. EPIEGRAM (Feb. 15, 1973) states that California is the only state that has legally mandated publishers to provide evidence of how effectively their material will work with specific learners. But the law is so recent that it has not yet been implemented. The few educational producers who have spent time and money testing their programs say that local and state officials seldom, if ever, ask for evidence of validity, or take the trouble of gathering it themselves before demanding that school districts use standardized tests to make critical decisions about individuals.

Amerindian and Chicano subjects typically do best on the performance scales of the "big two" individual mental tests, as do other disadvantaged groups where verbal skills are not continually reinforced. However, the subtest that contributes the most to the SB-LM-IQ, and the Verbal and Full Scale IQ's of the Wechsler batteries is vocabulary (Terman & Merrill, 1960; Wechsler, 1967; Cronbach, 1970, Buros, 1972). Vocabulary is a

relatively weak input to total intelligence for both retarded and nonretarded, male or female, Amerindians. Figures 1 and 2 (lifted from Hollingshead & Clayton, 1972) show results from a recently, federally funded study. Figure 1 underscores the fact that it is not just retarded Amerindians that have trouble with vocabulary on the WISC but also the nonretarded Amerindian Ss. Figure 2 relates to sex differences, but ones for retarded Ss. The Verbal subtest scaled scores on the left; the Performance scaled scores on the right of Vocabulary. The reviewer may note that females, in general--retarded or not, do better than males on the verbal skills; and the converse for the performance skills. However, also note that both sexes do equally poor on Vocabulary. {INSERT FIGURES 1 & 2 ABOUT HERE.}

Tables 1 and 2 show that in the general U.S. population the test-retest reliability and predictive validity correlation coefficients for the Vocabulary scale of the WISC and WAIS. The validity coefficients are particulary striking when considering that the SCAT and GRE or MAT usually only correlate in the 0.20 - 0.45 range with high school and college GPA's. This is one of the reasons that an item analysis must be conducted with the special populations in this proposal. Regardless of how one feels about reinforcing the Amerindian or Chicano to pursue his culture--language, rituals, arts, ad infin.--the empirical data about their disadvantages with English verbal skills, namely vocabularly, when we look at the school and college reports on success cannot simply be filed away as minute nightmares in the "American dream". {INSERT TABLES 1 & 2 ABOUT HERE.}

Palomares and Cummins (1967) present the same findings for Chicanos in their report for the California State Department of Education, as Hollingshead and Clayton did for Indians. They used the WISC to measure

the mental ability of rural Mexican-Americans in grades K-6. Figures 3, 4, 5, and 6 are lifted from their ERIC 'fiche (ED 017 959) and are representative of the WISC profiles reported. Notice that the Vocabulary scale again is the culprit of the profiles for Ss in grades two and three, and in grades five and six. The profiles all have positive slopes toward the Performance scales, except for grade six; but even in grade six, Vocabulary is one standard deviation below the national mean. Looking back at grade two (Figure 3) the reader sees that the mean Verbal Scale, excluding Vocabulary, is 7.25; or approximately a Verbal IQ of 87 (100 -2.75/3.00 X 15). If the Vocabulary Scale were used as an index of the Verbal IQ for these children it would be around 70-71 (Scaled Score =4.10, or -5.90/3.00 X 15 + 100 = 79). Thus, we cannot generalize by saying that Amerindians and Chicanos merely have low verbal intellignece--which certainly is valid for individual mental test results--instead, it must be emphasized that the low of the lows is vocabulary. The same statements are equally clearcut about grades three and five. {INSERT FIGURES 3, 4, 5, & 6 ABOUT HERE.}

The E is concurrently engaged with collecting WISC and SB-LM Vocabulary subtest data from the Regional Diagnostic Clinic-Joplin, Mo. Students in measurement and evaluation sections at MSSC have collected over 200 cases todate, but there are nearly 2,500 individual files yet to go before future sections of our advanced statistical analysis students get to punch the cards and dump into the 1130. However, we are noticing weak items for specific diagnostic categories by inspection. Consequently, "The Great Hope" for the utilization of the findings for the present proposal.

One last study concerning the mental ability of culturally disadvantaged groups by Anderson and Safar (1969) compares Anglo, Spanish-

American, and Indian samples from two New Mexico school systems. Fig. 7 is a lift job from their study (ERIC 'fiche accession no.: ED. 029 746) and shows the expected. Namely, that Angol Ss Spanish-American Ss Indian Ss in the proportion of children in the high ability group. Five of the six $X^2$'s are less than the 0.001 level of significance. High, medium, and low were defined respectively by percentile groupings of 60-99%ile, 40-59%ile, and 1-39%ile on several different mental ability tests: e. g., WISC, SB-LM, CCMT, or the Otis. System A was typically, rural New Mexico; while System B was rural but encompassed several military and government installation dependents. In a normal population, the expected proportions for H, M, and L would be 40, 20, and 40. It does not take a Jean Dixon act to see who gets the cheese in this type of cross-cultural study of mental ability as measured by Angol-culture tests. Yes, tests constructed by Anglos (if not WASP's), for the Anglos, undsoweiter.

With less license, the hypothesis of this proposal is (the $H_o$ avoided intentionally):

> Item analysis of WISC, and SB-LM Vocabulary item responses of Amerindian & Chicano Ss (also by different geographical bocale) will yield significantly different item-Vocabulary subtest covariances.

## Method

Subjects. During the spring semester of 1974 the vocabularly sections of WISC and Stanford-Binet (LM) protocols that had already been administered to Amerindian and Chicano Ss were collected from several sources. The major source of protocols for both of the individual mental tests, and for both ethnic groups, were obtained from

Arizona State University's Department of Educational Psychology. Files from their individual mental testing courses proved to be the single best source of protocols primarily because the public schools tended to use the two major tests in question usually for special education placement, and even then the investigator found that fewer and fewer individual mental tests are administered as one goes up the academic ladder. Gallup-McKinley County, New Mexico Public Schools was anticipated as an ideal data source because the school population there is approximately 40-, 40-, 20-per cent respectively, Chicano, Amerindian, and Anglo children. However, New Mexico's Department of Education informed the E that individual mental tests were no longer being administered. The same held for Albuquerque, which was anticipated as one of the ideal protocol collecting urban stations. Consequently, the investigation was limited to data sources from the White Mt. Apache reservation, and the Navajo reservation; mixed-tribal data from the Mesa, Arizona, Public Schools, and Pinal County, Arizona Superintendent of Education office. The sources above were located through the Arizona State Department of Education.

Apparatus. No instruments, or special equipment, was used in this study, other than those tests that had already been administered. Final analyses of the data were run on an IBM 370-125 at the School of the Ozarks, Point Lookout, Missouri, by their chief computer.

Procedures and Statistical Analysis. The major research sites have been listed above.

Test statistics are as varied as the number of authors publishing; however, two of the best appear to be Ferguson (1971) and DuBois (1965). The former approaches item analysis through covariance matrices, which is

simple enough, but very time consuming without computer aid; in fact, so time consuming, no one bothers with it period; particularly the respective test companies. After all, if one changed the flavor of "Coke" for the better, then it wouldn't be "Coke" anymore, would it? Continuing, covariance-matrix method starts by working on the internal consistency of the particular reference variable; namely, finding all the item-total test covariances ($r_{it}S_iS_t$'s). No small job for up to 40 vocabularly items by 1009 Ss. These respective covariances were found by summing up an individual item's variance and all of its inter-item covariances. From this columnar sum, one can determine each item's relative value, or input, by checking the proportion of the total test's variance (the sum of the entire matrix) accounted for by that particular item. Matrices were constructed--as well as CA, MA, and IQ norms, and CA-MA, MA-IQ, and CA-IQ coefficients of correlation--for the Chicano, Apache and "called Indian" Ss. The latter Ss were of mixed-tribes. Johnson-O'Malley Indian norms for the WISC were also constructed as well as matrices. The WISC norms include means, variances and standard deviations for the V-, P-, and full-scale-IQ's; and coefficients of correlation for V-P, P-FS, and V-FS intelligence quotients.

DuBois' approach to item-analysis is by way of approximations to multiple-linear R. Theoretically the correlation between some Vocabulary score, say on the Wechsler or the SB-LM, and some other variable, say the full-scale IQ on either test, can be improved by some approximation to multiple correlation, which would select items on the basis of high correlations with the criterion and low inter-item correlations with the predicting variable. Multiple correlation itself is as time-consuming as the approach mentioned first (Ferguson, 1971) to use as an item

selection technique. This approach is no worse than the first, if a big computer is available. The chief draw back is that its use would require fractional weights to be applied to the items in scoring the redeveloped Vocabularly scales. For example, regression weight one amount of item one, plus regression weight two times item two...plus regression weight k times item k, plus an error term. While the latter technique provides the best, perhaps, answer to the problem of redeveloping the Vocabularly Scales on the two major mental tests, it would be impossible without contracting with the parent companies, and even if the scales were redeveloped, it is predicted that they would seldom be used by test administrators in student personnel services of the schools. Why? Because those professionals did not have that technique presented to them by their major psychometric prof and a level-two statistical analysis course dealing with multiple-regression was not required. Nevertheless, serious students of individual, mental tests can appreciate the concept of what regression weights for individual items for specific ethnic groups means, and can certainly utilize the findings of this report that show what the proportionate value of each item's contribution to the total vocabularly. In the approach to item analysis used in this report, the item-vocabularly total covariances were converted to per cent of the total vocabularly score variance accounted for; and these item per cents are analogous to multiple-regression weights.

Results. Chicano norms are presented in Table 3 and their covariance matrix in Table 4. It must be remembered that 53 Chicano Ss that speak Spanish as their major language do not represent all Spanish speaking people on individual, mental tests given in English; however, they are no doubt very representative of Chicano Ss in the Southwest Desert

country who speak and comprehend little, or very little, English on the SB-LM.

{INSERT TABLES 3 & 4 ABOUT HERE.}

The respective per cent of the total vocabulary scale's variance for which each item accounts is as follows: 1. 3.47 2. 7.56 3. 5.11 4. 8.79 5. 9.81 6. 11.86 7. 10.94 8. 5.93 9. 9.50 10. 8.99 11. 5.52 12. 2.55 13. 5.31 14. 3.37 15. 1.43 16. -1.63 17. -0- 18. -0- 19. 1.43. Responses for item 20 and above were not included as the ceiling item reached for this group was item 19. The same reporting procedure for the item-covariance matrices of the other sub-groups will be maintained throughout the remainder of the result section; that is, the last item entered in each matrix is the last item scored correct before reaching the ceiling.

Note in the per cents presented for the Chicano Ss--which of course are the item-total vocabulary covariance's proportionate part of the total vocabulary scale's variance ($S^2$, which is also the sum of the matrix)--that they do not form any systematic curve in regard to magnitude of each respective item's per cent of the total variance. One would assume that the first items should contribute zero inputs and the items toward the ceiling item should also contribute zero amounts to the total variance, because the relative constant of either "all passing" or "all failing" is, by definition, non-variant; hence, the E is led to interprete this finding for the group above as an indication that the items are not on a "progressively-difficult gradient". For example, item "8. eyelash" contributes considerably less than do the following, supposedly more difficult items "9. Mars" and "10. juggler". And item "16. haste" has a negative covariance, which is followed by two items with zero coviances, and then unexpectedly item "19. regard"has a positive co-

variance of 1.43.

Navajo norms for Ss with mean CA of 10.42 (S=1.86) are presented in Table 5 and their item-vocabulary total, covariance matrix in Table 6 for the SB-LM. The mean IQ (SB-LM) of this group is low, but again, under the language handicap, this is understood; however, these children are public school Ss and individual, mental test scores are being used for special education placement purposes; N = 92.

{INSERT TABLES 5 & 6 ABOUT HERE}

The respective per cent of the total SB-LM vocabulary scale's variance for which each item accounts is as follows for Table 6: 1. 4.79 2. 8.66 3. 9.43 4. 11.91 5. 12.21 6. 11.21 7. 12.06 8. 3.40 9. 2.01 10. 0.30 11. -0- 12. 6.80 13. 6.80 14. 0.30 15. -0- 16. -0- 17. -0- 18. 5.02 19. -0- 20. 5.02. As with the Chicano group, there is no consistent, or symetrical, curve formed. The sporadic pattern suggests that extreme caution should be used in administering the vocabulary section to bi- and limited-bilingual Ss.

Norms for Apache Ss on the vocabulary scale of the SB-LM (CA=7.37, & S=1.10) are shown in Table 7; the item-total vocabulary covariance matrix in Table 8. The respective per cents for each item's covariance input of Table 8 are as follows: 1. 6.97 2. 17.05 3. 17.05 4. 17.05 5. 13.17 6. 17.05 7. -0- 8. 1.16. These covariances are not as inconsistent as the two group above; however the CA is lower and less variance is expected. There are unexpected reversals of levels of difficulty as indicated by items "5." vs. "6." and "7." vs. "8."

{INSERT TABLES 7 & 8 ABOUT HERE}

The SB-LM norms for Apache Ss, CA=9.8 (S=1.76), on the vocabulary scale are seen in Table 9, and the corresponding item-covariance per cents in Table 10. The respective per cents of Table 10 are: 1. 3.77 2. 17.92 3. 11.94 4. 8.17 5. 14.15 6. 9.11 7. 9.43 8. 12.89 9. 6.60 10. -0- 11. 5.97. The N for this group of Ss was 113. The

same general result is found with this group; namely, no systematic level-of-difficulty gradient as can be seen with item "8." vs. items "6." and/or "7", or item 10 vs. 11".

{INSERT TABLES 9 & 10 ABOUT HERE}

Norms on the SB-LM for 106 Ss, called "Indian", on the vocabulary scale are shown in Table 11; the covariance matrix follows in Table 12. The mean CA was 9195 and the standard deviation 1.75. The per cent of the variance for which each item accounted is as follows: 1. 2.35 2. 6.45 3. 12.14 4. 13.67 5. 9.92 6. 9.09 7. 9.99 8. 4.09 9. 9.71 10. 9.99 11. 4.30 12. -0- 13. 2.84 14. 2.56 15 -0- 16. -0- 17.2.84. Item "8. eyelash" again shows up accounting for a small per cent of the total variance of the vocabulary scale; especially, when compared with items "6." and "7.", and the immediate items following, "9." and "10". Items "15." and "16.", with zero input, appear out of place also, compared with the relative magnitudes of the per cents surrounding them.

{INSERT TABLES 11 & 12 ABOUT HERE}

Johnson-O'Malley Indian (P. L. 874 defined "Indian" as one-fourth) norms for the vocabulary section of the WISC are presented in Table 13. The mean CA for this group was 7.80; the S was 1.89. The performance IQ was considerably higher than the verbal IQ. This pattern was noted in the review of the literature as a common finding among "English deprived" Ss. Table 14 is the respective item-total vocabulary covariance matrix. The per cent of the variance for which each item accounted was: 1. 3.47 2. 7.56 3. 5.11 4. 8.79 5. 9.81 6. 11.86 7. 10.94 8. 5.93 9. 9.50 10. 8.99 11. 5.52 12. 2.55 13. 5.31 14. 3.37 15. 1.43 16. -1.63 17. -0- 18. -0- 19 1.43. Item "8." and items "12." and "17." and "18." appear to be relatively poor compared with items surrounding them. Apparently this group know more about "nails"

and "fur" than they do about "donkey". And they also know more about "nitroglycerine" (item 19.) than they do about "hero" and "gamble (items 17. and 18.). The same inference can be drawn concerning "spade" (item 12.) vs. "join" and "sword" (items 11. and 13.).

{INSERT TABLES 13 & 14 ABOUT HERE}

Johnson-O'Malley Indian norms on the WISC for Ss age 10 (mean CA=10.4; s=2.06) are shown in Table 15; the covariance matrix for the vocabularly scale in Table 16. The same relative high P-IQ vs V-IQ holds for this group of 130 Ss also. The individual item per cents were: 1. 2.74 2. 1.32 3. 1.97 4. 3.31 5. 2.56 6. 9.19 7. 3.79 8. 4.89 9. 9.07 10. 6.49 11. 7.78 12. 5.34 13. 5.50 14. 1.12 15. 7.30 16. 3.81 17. 5.04 18. 4.17 19. 2.96 20. 3.30 21. -0- 22. 4.37 23. -0- 24. -0- 25. 3.38. These per cents do not follow a systematic gradient of difficulty either. Note that "sword" and "brave" account for more of the vocabulary variance than the item they sandwich, "nuisance". Other items that probably depict the lack of extra-cultural interaction are "shilling" (item 21.) with zero input, and also "beliry" and "espionage" (items 23. & 24.); however, item "25." (stanza) follows with a per cent input of 3.38.

{INSERT TABLES 15 & 16 ABOUT HERE}

Norms for Johnson-O'Malley Ss (N=106, $\overline{CA}$=11.6, & S=1.74) on the WISC are shown in Table 17 and the accompanying item-total vocabulary covariance matrix in Table 18. The P-IQ is significantly higher than the V-IQ for these Ss also.

The individual item per cents of the total vocabulary variance were: 1. 0.61 2. -0- 3. 0.79 4. 2.99 5. 1.26 6. 8.20 7. 4.51

8. 2.36 9. 7.33 10. 6.51 11. 6.76 12. 4.56 13. 5.94 14. 3.19 15. 5.61 16. 7.51 17. 7.58 18. 6.13 19. 3.86 20. 5.42 21. 2.23 22. 2.02 23. -0- 24. 1.13 25. 3.40. The relatively small per cents for the initial items are to be expected as nearly all Ss pass those items; consequently, a relativel constant gives no variance, thus no covariance either. Item "8." (donkey) again appears out of order, as does item "23." (belfry) with its zero input. The latter, when compared with a supposedly more difficult word, "stanza" (item 25), appears to be a consistent finding.

{INSERT TABLES 17 & 18 ABOUT HERE}

WISC norms for Johnson-O'Malley Indian Ss ($N=93$, $\overline{CA}=13.4$, & $S=1.04$) are presenced in Table 19. Typical of past norms reported for Indian Ss, the P-IQ is significantly higher than the V-IQ. The r between the P-IQ's and the FS-IQ's is 0.85, which is considerably higher than the V-FS r of .73 or the V-P r of 0.37. However, these WISC, inter-IQ r's have not been found consistently in other Indian age groups.

The individual item-total vocabulary variance per cents from the covariance matrix of Table 20 were: 1. 2.00 2. 0.31 3. 0.96 4. 3.67 5. 2.00 6. 8.84 7. 2.31 8. 1.83 9. 6.36 10. 7.78 11. 5.09 12. 6.67 13. 1.60 14. 5.93 15. 6.99 16. 6.25 17. 8.85 18. 7.47 19. 3.00 20. 5.23 21. 2.60 22. 2.77 23. -0- 24. 4.13 25. -0- 26. -0- 27. -2.87. Item "23." (belfry) bombs out again and item "27." (spangle) has a negative covariance. The latter finding means that there was a tendency, but not a great one, for the higher scoring Ss to fail the item, and the lower scoring Ss to pass the item. Certainly, negative covariances are worse than zero covariances and even a classroom teacher would know enough about item analysis to "dump" the negative and zero input items.

{INSERT TABLES 19 & 20 ABOUT HERE}

The WISC norms for the last group of Ss, 62 Johnson-O'Malley Indians (CA=15.80; S=1.04), are shown in Table 21. As with the other WISC norms presented for Indian Ss in this study, the P-IQ is significantly higher than the V-IQ. The individual item-total vocabulary covariances, converted to per cents of the total variance of the vocabulary scale, were: 1. -0- 2. -0- 3. -0- 4. 2.17 5. 1.07 6. 4.93 7. 7.32 8. 3.58 9. 8.41 10. 8.37 11. 7.80 12. -0- 13. 10.43 14. -0- 15. 10.90 16. -0- 17. 13.15 18. 11.24 19. 6.47 20 8.35 21. -0- 22. -4.23. No variance is accounted for by items "1.-3." because all Ss passed those relatively easy items; the same finding for item "12." (spade). Item "14." (nuisance) shows zero contribution to the variance of the vocabulary scale also, but this time because all Ss failed the item. Items "16." and "21." (nonsense and shilling) made no input either. This is a consistent finding for Indian Ss on the WISC vocabulary apparently; at least for Ss with limited English backgrounds. Unexpectedly, this older group of Ss shows a negative covariance for item "22." (fable), which was also the ceiling. No consistent level-of-difficulty gradient can be observed with this group either.

## Discussion

Overview While the Stanford-Binet remains the standard instrument for intelligence testing with young children, it is less frequently used today in testing Chicano and Amerindian Ss; and with the WPPSI, WISC and the recent WISC-R, and WAIS available the Standford-Binet should probably not be used at all with Ss who have limited English language backgrounds. At least the Performance IQ from the Wechsler series is less culturally biased than the SB-LM, and the differential between the V-IQ and the P-IQ

is, no doubt, primarily an indication of ignorance--or lack of knowledge--rather than lack of intelligence. The major problem of both the vocabulary scales involved is that the items from the scales presuppose a particular background of experience. Is a "culture-fair" test the answer? No, because there cannot really be a "culture-fair" test as no individual is culture-free. His performance will always be affected by his background and experience, no matter what the nature of the test. More important for the ethnic groups of this report would be culture-fair "interpretations". The results of this study offer a possible solution by showing how the internal consistencies of the vocabulary scales for specific groups can be improved with item analysis techniques; namely, the covariance-matrix method for determing weak items. This method deals with all Ss of a sample rather than some upper and lower fraction of the group (for a USAFE item analysis that would be the upper, and the lower, 27 per cent) and combines the dual criteria of level-of-difficulty and discriminatory index, or capacity, into a single index--the item-total test (vocabulary scale) covariance. The problem of improving the internal consistencies of tests appears to have a simple solution via item-analysis, covariance matrix, or even multiple-regression, methods. But there is a rub. Test companies are resistent to change, even though their mission is to construct tests to capture maximum variability. Specific norms for every ethnic group and frequent revisions are costly. Nevertheless, the covariance-matrix method could, and should, be used more frequently than it currently is. Particulary with the major ethnic groups in the U.S. Merely including a porportionate number of, say, Blacks, Chicanos, Amerindians or Welshmen in the standardization population looks very fair; but do you "reckon" that a Navajo Reservation Indian child, in his "right mind", would walk to the next trading post for a loaf of bread if the local had none(?).

And even if the local had bread, or more probable, flour, do you suppose the child would use "shillings" for payment? Or would he just make a "nuisance" of himself by trying to pawn some of the family's turquoise. Yes, the WASP E speak with forked-facetiae; but well-intended for the ethnic groups of this report.

The cost of specific norms for specific groups would not be as prohibitive as saving-face for most test companies. Annual norms could be provided and sold to specific groups; surely, at a profit.

General considerations. The item-total vocabulary covariances provided in this report can serve as a single index "worth". This index is the contribution of the individual item to the variance of the scale scores. The presumption here is that in the construction, or re-construction, of tests we wish, as it were, to acquire or capture variance. An item that contributes more to the total variance is presumed to be a "better" item than one that contributes less. This report has listed several vocabulary items for specific reference groups that contribute very little, and often in a negative direction, to the variance of the two vocabulary scales studies.

Many of the findings defy explanation when age, or tribal, groups are compared. But shoe manufacturers know, as do test construction companies, that no shoe, mass produced, fits as well as a moccasin or Spanish boot that has been handmade in scale with the foot of the wearer.

Item analysis is not the answer to culture-fair tests.

## Epilogue

Bilingual programs for Chicano children are being developed in at least 15 states besides Texas for students who speak primarily Spanish (SEDL, 211 E. 7th St., Austin, Tex. 78701). Bilingual kindergarten programs for Amerindian children should also be developed and NIE is funding.

TABLE I

Test-Retest Correlations and Standard Errors of Measurement for Form I
(N = 158)

| Subtests | Correlations | SE meas. |
|---|---|---|
| Information | .86 | .68 |
| Comprehension | .74 | 1.21 |
| Digit Span | .67 | 1.68 |
| Arithmetic | .62 | 2.06 |
| Similarities | .71 | 1.22 |
| Vocabulary | .88 | .73 |
| Picture Arrangement | .64 | 1.82 |
| Picture Completion | .83 | .95 |
| Block Design | .84 | 1.10 |
| Object Assembly | .69 | 1.31 |
| Digit Symbol | .80 | 1.06 |
| Verbal IQ | .84 | 3.96 |
| Nonverbal IQ | .86 | 4.49 |
| Full-Scale IQ | .90 | 3.29 |

Source: G.F. Derner et al.

TABLE II

Correlations of school marks with Wechsler scores

| | High school | College |
|---|---|---|
| Information | 0.54 | 0.48 |
| Comprehension | 0.55 | 0.33 |
| Arithmetic | 0.45 | 0.19 |
| Similarities | 0.50 | 0.39 |
| Digit Span | 0.37 | 0.04 |
| Vocabulary | 0.65 | 0.46 |
| Digit Symbol | 0.34 | 0.15 |
| Picture Completion | 0.33 | 0.20 |
| Block Design | 0.29 | 0.19 |
| Pciture Arrangement | 0.22 | 0.07 |
| Object Assembly | 0.17 | 0.12 |
| Verbal | 0.63 | 0.47 |
| Performance | 0.43 | 0.24 |
| Full Scale | 0.62 | 0.44 |

Source: Conry & Plant, 1965:

TABLE III
CHICANO NORMS RESPONSES OF
STANFORD-BINET (LM) CA: 10.23

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| CA | 10.23 | 5.75 | 2.40 |
| MA | 7.25 | 2.81 | 1.68 |
| IQ | 73.51 | 133.84 | 11.57 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| CA and MA | 0.66 |
| MA and IQ | 0.42 |
| CA and IQ | -0.33 |

TABLE IV
COVARIANCE MATRIX OF CHICANO RESPONSES
ON STANFORD-BINET (LM)
(CA.: 10.23)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .07 | .04 | .01 | .03 | .05 | .05 | .06 | .02 | .00 | -.03 |
| 2 | .04 | .11 | .09 | .09 | .08 | .08 | .09 | .07 | .04 | .03 |
| 3 | .01 | .09 | .13 | .06 | .04 | .07 | .09 | .05 | .02 | .01 |
| 4 | .03 | .09 | .06 | .21 | .09 | .05 | .08 | .04 | .07 | .04 |
| 5 | .05 | .08 | .04 | .09 | .25 | .10 | .09 | .04 | .03 | .06 |
| 6 | .05 | .08 | .07 | .05 | .10 | .24 | .10 | .08 | .10 | .08 |
| 7 | .06 | .09 | .09 | .08 | .09 | .10 | .21 | .08 | .07 | .06 |
| 8 | .02 | .07 | .05 | .04 | .04 | .08 | .08 | .16 | .08 | .01 |
| 9 | .00 | .04 | .02 | .07 | .03 | .10 | .07 | .08 | .26 | .08 |
| 10 | -.03 | .03 | .01 | .04 | .06 | .08 | .06 | .01 | .08 | .25 |
| 11 | .01 | .01 | .02 | .01 | .04 | .07 | .04 | .00 | .03 | .09 |
| 12 | .00 | .01 | .01 | .02 | .00 | .03 | .02 | -.02 | .01 | .05 |
| 13 | .01 | .00 | .02 | .06 | .02 | .03 | .03 | -.01 | .09 | .08 |
| 14 | .01 | .00 | -.06 | .04 | .06 | .04 | .03 | .02 | .06 | .01 |
| 15 | .01 | .00 | -.07 | .02 | -.02 | .02 | .01 | .01 | .02 | .03 |
| 16 | .00 | .00 | .00 | -.06 | .01 | .01 | .01 | -.06 | -.05 | .01 |
| 17 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 18 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 19 | .00 | .00 | .01 | .01 | .02 | .01 | .00 | .01 | .02 | .02 |
| Σ | .34 | .74 | .50 | .86 | .96 | 1.16 | 1.07 | .58 | .93 | .88 |

| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | .01 | .00 | .01 | .01 | .01 | .00 | .00 | .00 | .00 |
| 2 | .01 | .01 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 3 | .02 | .01 | .02 | -.06 | -.07 | .00 | .00 | .00 | .01 |
| 4 | .01 | .02 | .06 | .04 | .02 | -.06 | .00 | .00 | .01 |
| 5 | .04 | .00 | .02 | .06 | -.02 | .01 | .00 | .00 | .02 |
| 6 | .07 | .03 | .03 | .04 | .02 | .01 | .00 | .00 | .01 |
| 7 | .04 | .02 | .03 | .03 | .01 | .01 | .00 | .00 | .00 |
| 8 | .00 | -.02 | -.01 | .02 | .01 | -.06 | .00 | .00 | .01 |
| 9 | .03 | .01 | .09 | .06 | .02 | -.05 | .00 | .00 | .02 |
| 10 | .09 | .05 | .08 | .01 | .03 | .01 | .00 | .00 | .02 |
| 11 | .17 | .04 | .04 | -.01 | .02 | -.02 | .00 | .00 | -.02 |
| 12 | .04 | .09 | .04 | -.02 | -.01 | -.01 | .00 | .00 | -.01 |
| 13 | .04 | .04 | .19 | -.05 | .02 | -.02 | .00 | .00 | -.03 |
| 14 | -.01 | -.02 | -.05 | .15 | .02 | -.01 | .00 | .00 | .04 |
| 15 | .02 | -.01 | .02 | .02 | .08 | -.01 | .00 | .00 | -.01 |
| 16 | -.02 | -.01 | -.02 | -.01 | -.01 | .05 | .00 | .00 | -.01 |
| 17 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 18 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 19 | -.02 | -.01 | -.03 | .04 | -.01 | -.01 | .00 | .00 | .08 |
| Σ | .54 | .25 | .52 | .33 | .14 | -.16 | -0- | -0- | .14 |

$9.78 = S^2$, Matrix Total

TABLE V
NAVAHO NORMS RESPONSES OF
STANFORD-BINET (LM), CA: 10.42

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| CA | 10.42 | 3.46 | 1.86 |
| MA | 5.78 | 3.48 | 1.87 |
| IQ | 58.36 | 205.48 | 14.33 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| CA and MA | 0.34 |
| MA and IQ | 0.90 |
| CA and IQ | -0.06 |

TABLE VI
COVARIANCE MATRIX OF NAVAHO RESPONSES
ON STANFORD-BINET (LM)
(CA.: 10.42)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | .25 | .02 | .02 | .12 | .06 | .01 | .05 | -.07 | .00 |
| 2 | .02 | .25 | .17 | .12 | .14 | .16 | .15 | -.03 | .06 |
| 3 | .02 | .17 | .25 | .19 | .14 | .16 | .15 | .14 | .00 |
| 4 | .12 | .12 | .19 | .27 | .19 | .15 | .23 | .05 | .10 |
| 5 | .06 | .14 | .14 | .19 | .25 | .22 | .22 | .00 | .16 |
| 6 | .01 | .16 | .16 | .15 | .22 | .26 | .18 | .02 | .13 |
| 7 | .05 | .15 | .15 | .23 | .22 | .18 | .27 | .02 | .13 |
| 8 | -.07 | -.03 | .14 | .05 | .00 | .02 | .02 | .18 | .05 |
| 9 | .00 | .06 | .00 | .10 | .16 | .13 | .13 | .05 | .25 |
| 10 | .04 | .02 | .00 | .03 | .05 | .04 | .04 | .02 | .08 |
| 11 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 12 | .04 | .02 | .00 | .03 | .05 | .04 | .04 | .02 | -.04 |
| 13 | .04 | .02 | .00 | .03 | .05 | .04 | .04 | .02 | -.04 |
| 14 | .04 | .02 | .00 | .03 | .05 | .04 | .04 | .02 | .08 |
| 15 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 16 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 17 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 18 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | -.35 |
| 19 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 20 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | -.35 |
| Σ | .62 | 1.12 | 1.22 | 1.54 | 1.58 | 1.45 | 1.56 | .44 | .26 |

| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .04 | .00 | .04 | .04 | .04 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 2 | .02 | .00 | .02 | .02 | .02 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 4 | .03 | .00 | .03 | .03 | .03 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 5 | .05 | .00 | .05 | .05 | .05 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 6 | .04 | .00 | .04 | .04 | .04 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 7 | .04 | .00 | .04 | .04 | .04 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 8 | .02 | .00 | .02 | .02 | .02 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 9 | .08 | .00 | -.04 | -.04 | .08 | .00 | .00 | .00 | -.35 | .00 | -.35 | |
| 10 | .11 | .00 | -.01 | -.01 | .11 | .00 | .00 | .00 | -.24 | .00 | -.24 | |
| 11 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 12 | -.01 | .00 | .11 | .11 | -.01 | .00 | .00 | .00 | .24 | .00 | .24 | |
| 13 | -.01 | .00 | .11 | .11 | -.01 | .00 | .00 | .00 | .24 | .00 | .24 | |
| 14 | .11 | .00 | -.01 | -.01 | .11 | .00 | .00 | .00 | -.24 | .00 | -.24 | |
| 15 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 16 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 17 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 18 | -.24 | .00 | .24 | .24 | -.24 | .00 | .00 | .00 | .50 | .00 | .50 | |
| 19 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 20 | -.24 | .00 | .24 | .24 | -.24 | .00 | .00 | .00 | .50 | .00 | .50 | |
| Σ | .04 | -0- | .88 | .88 | .04 | -0- | -0- | -0- | .65 | -0- | .65 | $12.93 = S^2$, Matrix Total |

TABLE VII
APACHE NORMS RESPONSES OF
STANFORD-BINET (LM), CA: 7.37

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| CA | 7.37 | 1.20 | 1.10 |
| MA | 4.92 | 2.63 | 1.62 |
| IQ | 62.78 | 615.63 | 24.81 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| CA and MA | 0.36 |
| MA and IQ | 0.87 |
| CA and IQ | 0.05 |

TABLE VIII
COVARIANCE MATRIX OF APACHE RESPONSES
ON STANFORD-BINET (LM)
(CA.: 7.37)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | |
|---|---|---|---|---|---|---|---|---|---|
| 1 | .14 | .05 | .05 | .05 | .02 | .05 | .00 | .00 | |
| 2 | .05 | .24 | .01 | .07 | .12 | .24 | .00 | .09 | |
| 3 | .05 | .07 | .24 | .24 | .12 | .07 | .00 | .09 | |
| 4 | .05 | .07 | .24 | .24 | .12 | .07 | .00 | .09 | |
| 5 | .02 | .12 | .12 | .12 | .14 | .12 | .00 | .04 | |
| 6 | .05 | .24 | .07 | .07 | .12 | .24 | .00 | .09 | |
| 7 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | |
| 8 | .00 | .09 | .09 | .09 | .04 | .09 | .00 | .20 | |
| Σ | .36 | .88 | .88 | .88 | .68 | .88 | -0- | .60 | $5.16=S^2$, Matrix Total |

TABLE IX
APACHE NORMS RESPONSES OF
STANFORD-BINET (LM), CA: 9.8

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| CA | 9.80 | 3.11 | 1.76 |
| MA | 5.79 | 1.00 | 1.00 |
| IQ | 61.82 | 81.24 | 9.01 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| CA and MA | 0.03 |
| MA and IQ | 0.70 |
| CA and IQ | -.59 |

TABLE X
COVARIANCE MATRIX OF APACHE RESPONSES
ON STANFORD-BINET (LM)
(CA: 9.8)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .12 | -.04 | -.02 | .02 | .01 | -.01 | .01 | .03 | -.01 | .00 | .01 |
| 2 | -.04 | .26 | .07 | .01 | .07 | .01 | .04 | .10 | .03 | .00 | .02 |
| 3 | -.02 | .07 | .23 | -.01 | .03 | .05 | .03 | -.05 | .04 | .00 | .01 |
| 4 | .02 | .01 | -.01 | .12 | .02 | .04 | .02 | .03 | -.02 | .00 | .03 |
| 5 | .01 | .07 | .03 | .02 | .20 | .05 | .01 | .00 | .04 | .00 | .02 |
| 6 | -.01 | .01 | .05 | .04 | .05 | .12 | .02 | .00 | .02 | .00 | .03 |
| 7 | .01 | .04 | .03 | .02 | .01 | .02 | .08 | .04 | .02 | .00 | .03 |
| 8 | .03 | .10 | -.05 | .03 | .00 | .00 | .04 | .25 | -.00 | .00 | .01 |
| 9 | -.01 | .03 | .04 | -.02 | .04 | -.02 | .02 | -.00 | .14 | .00 | -.01 |
| 10 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 11 | .01 | .02 | .01 | .03 | .02 | .03 | .03 | .01 | -.01 | .00 | .04 |
| Σ | .12 | .57 | .38 | .26 | .45 | .29 | .30 | .41 | .21 | -0- | .19 |

$3.18=S^2$, Matrix Total

TABLE XI
CALL INDIAN NORMS RESPONSES OF
STANFORD-BINET (LM), CA: 9.95

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| CA | 9.95 | 3.08 | 1.75 |
| MA | 6.69 | 2.26 | 1.50 |
| IQ | 69.91 | 178.29 | 13.35 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| CA and MA | 0.41 |
| MA and IQ | 0.72 |
| CA and IQ | -0.30 |

TABLE XII
COVARIANCE MATRIX OF CALL INDIAN RESPONSES
ON STANFORD-BINET (LM)
(CA: 9.95)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 |
|---|---|---|---|---|---|---|---|---|
| 1 | .09 | .07 | .05 | .05 | .03 | .05 | .00 | .00 |
| 2 | .07 | .22 | .16 | .14 | .08 | .14 | .12 | .00 |
| 3 | .05 | .16 | .27 | .23 | .14 | .23 | .13 | .12 |
| 4 | .05 | .14 | .23 | .27 | .16 | .17 | .21 | .09 |
| 5 | .03 | .08 | .14 | .16 | .22 | .06 | .12 | .05 |
| 6 | .05 | .14 | .23 | .17 | .06 | .27 | .08 | .09 |
| 7 | .00 | .12 | .13 | .21 | .12 | .08 | .25 | .12 |
| 8 | .00 | .00 | .12 | .09 | .05 | .09 | .12 | .12 |
| 9 | .00 | .00 | .16 | .25 | .12 | .08 | .16 | .00 |
| 10 | .00 | .00 | .13 | .20 | .19 | .03 | .13 | .00 |
| 11 | .00 | .00 | .03 | .05 | .08 | .05 | .03 | .00 |
| 12 | .00 | .00 | .-0 | .00 | .00 | .00 | .00 | .00 |
| 13 | .00 | .00 | .07 | .10 | .02 | -.08 | .06 | .00 |
| 14 | .00 | .00 | .03 | .05 | .08 | .05 | .03 | .00 |
| 15 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 16 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 17 | .00 | .00 | .00 | .00 | .08 | .09 | .00 | .00 |
| Σ | .34 | .93 | 1.75 | 1.97 | 1.43 | 1.31 | 1.44 | .59 |

| | 9 | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 3 | .16 | .13 | .03 | .00 | .07 | .03 | .00 | .00 | .00 |
| 4 | .25 | .20 | .05 | .00 | .10 | .05 | .00 | .00 | .00 |
| 5 | .12 | .19 | .08 | .00 | .02 | .08 | .00 | .00 | .08 |
| 6 | .08 | .03 | .05 | .00 | -.08 | .05 | .00 | .00 | .09 |
| 7 | .16 | .13 | .03 | .00 | .06 | .03 | .00 | .00 | .00 |
| 8 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 9 | .24 | .19 | .05 | .00 | .10 | .05 | .00 | .00 | .00 |
| 10 | .19 | .29 | .07 | .00 | .14 | .07 | .00 | .00 | .00 |
| 11 | .05 | .07 | .14 | .00 | -.05 | -.02 | .00 | .00 | .19 |
| 12 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 13 | .10 | .14 | -.05 | .00 | .24 | -.05 | .00 | .00 | -.14 |
| 14 | .05 | .07 | -.02 | .00 | -.05 | .14 | .00 | .00 | -.06 |
| 15 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 16 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 17 | .00 | .00 | .19 | .00 | -.14 | -.06 | .00 | .00 | .25 |
| Σ | 1.40 | 1.44 | .62 | .00 | .41 | .37 | -0- | -0- | .41 |

$14.41=S^2$, Matrix Total

TABLE XIII
JOHNSON-O'MALLEY INDIAN
NORMS RESPONSES OF WISC
(Ages 6, 7, 8, & 9)

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| V. | 71.98 | 260.52 | 16.14 |
| P. | 93.78 | 238.28 | 15.44 |
| FS. | 80.63 | 239.64 | 15.48 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| V. and P. | 0.58 |
| P. and FS. | 0.87 |
| V. and FS. | 0.90 |

TABLE XIV
COVARIANCE MATRIX OF
JOHNSON-O'MALLEY INDIAN RESPONSES ON WISC
(Ages 6, 7, 8, & 9)

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .72 | .27 | .45 | .32 | .29 | .03 | .10 | .12 | .19 | .02 |
| 2 | .27 | .52 | .41 | .26 | .40 | .09 | .05 | .10 | .08 | .07 |
| 3 | .45 | .41 | .59 | .32 | .36 | .11 | -.04 | -.09 | .12 | -.09 |
| 4 | .32 | .26 | .32 | 1.00 | .58 | .26 | .22 | .14 | .36 | .27 |
| 5 | .29 | .40 | .36 | .58 | .93 | .26 | .29 | .31 | .25 | .24 |
| 6 | .03 | .09 | .11 | .26 | .26 | .58 | .22 | .02 | .23 | .12 |
| 7 | .10 | .05 | -.04 | .22 | .29 | .22 | .74 | .22 | .14 | .09 |
| 8 | .12 | .10 | -.09 | .14 | .31 | .02 | .22 | .55 | -.02 | .11 |
| 9 | .19 | .08 | .12 | .36 | .25 | .23 | .14 | -.02 | .72 | .44 |
| 10 | .02 | .07 | -.09 | .27 | .24 | .12 | .09 | .11 | .44 | .66 |
| 11 | .18 | .07 | .11 | .41 | .24 | .15 | .24 | .02 | .37 | .46 |
| 12 | .04 | .02 | .03 | -.04 | .06 | .06 | -.07 | .05 | .07 | .07 |
| 13 | .27 | .13 | .20 | .35 | .15 | .13 | .15 | -.09 | .25 | .11 |
| 14 | .02 | .00 | .01 | .04 | .02 | -.04 | -.04 | .03 | .10 | .11 |
| 15 | .21 | .00 | .20 | .41 | .04 | .20 | .14 | .14 | .16 | .16 |
| 16 | .00 | .00 | .00 | .09 | .06 | .09 | -.02 | .08 | .03 | .15 |
| 17 | .00 | .00 | .00 | -.18 | .21 | .04 | .39 | .29 | -.22 | -.02 |
| 18 | .00 | .00 | .00 | .05 | .03 | .04 | -.01 | .04 | .02 | .09 |
| 19 | .00 | .00 | .00 | .06 | .03 | .17 | .06 | .05 | .14 | .15 |
| 20 | .00 | .00 | .00 | -.05 | .10 | .14 | .13 | .03 | -.05 | -.08 |
| 21 | .00 | .00 | .00 | .12 | .00 | .00 | -.22 | .09 | .06 | .17 |
| Σ | 3.23 | 2.47 | 2.69 | 4.99 | 4.85 | 2.90 | 2.78 | 2.19 | 3.44 | 3.30 |

| | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .18 | .04 | .27 | .02 | .21 | .00 | .00 | .00 | .00 | .00 | .00 |
| 2 | .07 | .02 | .13 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 3 | .11 | .03 | .20 | .01 | .20 | .00 | .00 | .00 | .00 | .00 | .00 |
| 4 | .41 | -.04 | .35 | .04 | .41 | .09 | -.18 | .05 | .06 | -.05 | .12 |
| 5 | .24 | .06 | .15 | .02 | .04 | .06 | .21 | .03 | .03 | .10 | .00 |
| 6 | .15 | .06 | .13 | -.04 | .20 | .09 | .04 | .04 | .17 | .14 | .00 |
| 7 | .24 | -.07 | .15 | -.04 | .14 | -.02 | .39 | -.01 | .06 | .13 | -.22 |
| 8 | .02 | .05 | -.09 | .03 | .14 | .08 | .29 | .04 | .05 | .03 | .09 |
| 9 | .37 | .07 | .25 | .10 | .16 | .03 | -.22 | .02 | .14 | -.05 | .06 |
| 10 | .46 | .07 | .11 | .11 | .16 | .15 | -.02 | .09 | .15 | -.08 | .17 |
| 11 | .66 | .06 | .24 | .02 | .43 | .13 | .08 | .07 | .12 | -.03 | .04 |
| 12 | .06 | .26 | .01 | .00 | .07 | -.02 | -.03 | -.01 | .16 | -.08 | -.03 |
| 13 | .24 | .01 | .75 | .08 | .39 | .16 | .05 | .08 | -.06 | .31 | .15 |
| 14 | .02 | .00 | .08 | .17 | .08 | .17 | -.06 | .09 | -.01 | -.04 | .22 |
| 15 | .43 | .07 | .39 | .08 | .79 | .16 | .10 | .08 | .08 | .01 | .13 |
| 16 | .13 | -.02 | .16 | .17 | .16 | .36 | .07 | .19 | -.02 | .13 | .35 |
| 17 | .08 | -.03 | .05 | -.06 | .10 | .07 | .87 | .04 | .03 | .28 | -.11 |
| 18 | .07 | -.01 | .08 | .09 | .08 | .19 | .04 | .09 | -.01 | .07 | .18 |
| 19 | .12 | .16 | -.06 | -.01 | .08 | -.02 | .03 | -.01 | .22 | -.05 | -.04 |
| 20 | -.03 | -.08 | .31 | -.04 | .01 | .13 | .28 | .07 | -.05 | .51 | .02 |
| 21 | .04 | -.03 | .15 | .22 | .13 | .35 | -.11 | .18 | -.04 | .02 | .39 |
| Σ | 4.07 | .68 | 3.81 | .97 | 3.98 | 2.16 | 1.83 | 1.13 | 1.08 | 1.35 | 1.52 |

$55.42 = S^2$, Matrix Total

TABLE XV
JOHNSON-O'MALLEY INDIAN
NORMS RESPONSES OF WISC
(Age 10)

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| V. | 75.69 | 231.40 | 15.21 |
| P. | 95.17 | 195.97 | 14.00 |
| FS. | 83.49 | 194.38 | 13.94 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| V. and P. | 0.47 |
| P. and FS. | 0.83 |
| V. and FS. | 0.88 |

TABLE XVI
COVARIANCE MATRIX OF
JOHNSON-O'MALLEY INDIAN RESPONSES ON WISC
(Age 10)

1-2

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .33 | .11 | .10 | .20 | .09 | .15 | .27 | .17 | .15 | .19 | .10 | .07 | .06 |
| 2 | .11 | .12 | .11 | .11 | .11 | .05 | .09 | .10 | .05 | .06 | .07 | .03 | .09 |
| 3 | .10 | .11 | .23 | .09 | .10 | .10 | .05 | .14 | .10 | .13 | .14 | -.00 | .12 |
| 4 | .20 | .11 | .09 | .43 | .08 | .20 | .30 | .34 | .15 | .19 | .17 | .03 | .16 |
| 5 | .09 | .11 | .10 | .08 | .33 | .15 | .14 | .11 | .15 | .13 | .22 | .09 | .14 |
| 6 | .15 | .05 | .10 | .20 | .15 | .93 | .37 | .34 | .73 | .41 | .62 | .42 | .33 |
| 7 | .27 | .09 | .05 | .30 | .14 | .37 | .73 | .23 | .33 | .19 | .35 | ,09 | ,34 |
| 8 | .17 | .10 | .14 | .34 | .11 | .34 | .23 | .49 | .27 | .24 | ,38 | .06 | .15 |
| 9 | .15 | .05 | .10 | .15 | .15 | .73 | .33 | .27 | .79 | .44 | ,59 | .41 | .39 |
| 10 | .19 | .06 | .13 | .19 | .13 | .41 | .19 | .24 | .44 | .82 | .36 | .22 | .33 |
| 11 | .10 | .07 | .14 | .17 | .22 | .62 | .35 | .38 | .59 | .36 | .71 | .24 | .36 |
| 12 | .07 | .03 | -.00 | .03 | .09 | .42 | .09 | .06 | .41 | .22 | .24 | .63 | .30 |
| 13 | .06 | .09 | .12 | .16 | .14 | .33 | .34 | .15 | .39 | .33 | .36 | .30 | .68 |
| 14 | .02 | .01 | .01 | .02 | .02 | .04 | -.04 | .01 | .04 | .06 | .02 | .08 | .06 |
| 15 | .12 | .00 | .10 | -.12 | .12 | .63 | .25 | .08 | .72 | .36 | .57 | .31 | .24 |
| 16 | .05 | .00 | .04 | .05 | .05 | .36 | .19 | .18 | .35 | .28 | .32 | .04 | .13 |
| 17 | .07 | .00 | .06 | .08 | .07 | .52 | .20 | .23 | .43 | .14 | ,29 | .18 | .17 |
| 18 | .05 | .00 | .04 | .05 | .05 | .33 | -.11 | .15 | .25 | .13 | .17 | .25 | .20 |
| 19 | .00 | .00 | .00 | .07 | .00 | .28 | -.27 | .01 | .30 | .04 | .07 | .29 | .05 |
| 20 | .00 | .00 | .00 | .01 | .00 | .26 | -.09 | .15 | .47 | .16 | .40 | .29 | -.16 |
| 21 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 22 | .00 | .00 | .00 | .09 | .00 | .28 | -.33 | .16 | .29 | .33 | .23 | .06 | .25 |
| 23 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 24 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 25 | .00 | .00 | .00 | .08 | .00 | .21 | -.10 | .12 | .21 | .24 | .15 | .39 | .23 |
| Σ | 2.30 | 1.11 | 1.66 | 2.78 | 2.15 | 7.71 | 3.18 | 4.11 | 7.61 | 5.45 | 6.53 | 4.48 | 4.62 |

TABLE XVI
COVARIANCE MATRIX OF
JOHNSON-O'MALLEY INDIAN RESPONSES ON WISC
(Age 10)

2-2

| | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .02 | .12 | .05 | .07 | .05 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 2 | .01 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 3 | .01 | .10 | .04 | .06 | .04 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 4 | .02 | .12 | .05 | .08 | .05 | .07 | .01 | .00 | .09 | .00 | .00 | .08 |
| 5 | .02 | .12 | .05 | .07 | .05 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 6 | .04 | .63 | .36 | .52 | .33 | .28 | .26 | .00 | .28 | .00 | .00 | .21 |
| 7 | -.04 | .25 | .19 | .20 | -.11 | -.27 | -.09 | .00 | -.33 | .00 | .00 | -.10 |
| 8 | .01 | .08 | .18 | .23 | .15 | .01 | .15 | .00 | .16 | .00 | .00 | .12 |
| 9 | .04 | .72 | .35 | .43 | .25 | .30 | .47 | .00 | .29 | .00 | .00 | .21 |
| 10 | .06 | .36 | .28 | .14 | .13 | .04 | .16 | .00 | .33 | .00 | .00 | .24 |
| 11 | .02 | .57 | .32 | .29 | .17 | .07 | .40 | .00 | .23 | .00 | .00 | .15 |
| 12 | .08 | .31 | .04 | .18 | .25 | .29 | .29 | .00 | .06 | .00 | .00 | .39 |
| 13 | .06 | .24 | .13 | .17 | .20 | .05 | -.16 | .00 | .25 | .00 | .00 | .23 |
| 14 | .09 | .03 | -.03 | .04 | .11 | .12 | .04 | .00 | .12 | .00 | .00 | .07 |
| 15 | .03 | .85 | .28 | .30 | .17 | .25 | .46 | .00 | .26 | .00 | .00 | .17 |
| 16 | -.03 | .28 | .40 | .32 | .10 | -.19 | .00 | .00 | .27 | .00 | .00 | .01 |
| 17 | .04 | .30 | .32 | .57 | .34 | -.04 | -.04 | .00 | .27 | .00 | .00 | .03 |
| 18 | .11 | .17 | .10 | .34 | .51 | .22 | -.02 | .00 | .44 | .00 | .00 | .07 |
| 19 | .12 | .25 | -.19 | -.04 | .22 | .70 | .30 | .00 | .25 | .00 | .00 | .04 |
| 20 | .04 | .46 | .00 | -.04 | -.02 | .30 | .79 | .00 | -.14 | .00 | .00 | .31 |
| 21 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 22 | .12 | .26 | .27 | .27 | .44 | .25 | -.14 | .00 | .80 | .00 | .00 | .04 |
| 23 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 24 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 25 | .07 | .17 | .01 | .03 | .07 | .04 | .31 | .00 | .04 | .00 | .00 | .57 |
| Σ | .94 | 6.13 | 3.20 | 4.23 | 3.50 | 2.49 | 3.19 | -0- | 3.67 | -0- | -0- | 2.84 |

$83.88=S^2$, Matrix Total

TABLE XVII
JOHNSON-O'MALLEY INDIAN
NORMS RESPONSES OF WISC
(Ages 11 & 12)

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| V. | 79.26 | 314.16 | 17.72 |
| P. | 90.56 | 242.91 | 15.59 |
| FS. | 83.56 | 262.21 | 16.19 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| V. and P. | 0.58 |
| P. and FS. | 0.83 |
| V. and FS. | 0.93 |

TABLE XVIII
COVARIANCE MATRIX OF
JOHNSON-O'MALLEY INDIAN RESPONSES ON WISC
(Ages 11 & 12)

1-2

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 | 12 | 13 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .08 | .00 | -.00 | .07 | -.00 | .04 | .03 | .03 | .05 | .05 | .05 | .01 | .06 |
| 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 3 | -.00 | .00 | .08 | -.01 | -.00 | .04 | .07 | .03 | .05 | .05 | .05 | .01 | .02 |
| 4 | .07 | .00 | -.01 | .37 | .07 | .14 | .27 | .12 | .15 | .16 | .20 | .06 | .18 |
| 5 | -.00 | .00 | -.00 | .07 | .16 | .09 | .06 | .06 | .08 | .06 | .08 | .02 | .03 |
| 6 | .04 | .00 | .04 | .14 | .09 | .87 | .27 | .18 | .41 | .42 | .51 | .28 | .35 |
| 7 | .03 | .00 | .07 | .27 | .06 | .27 | .43 | .12 | .34 | .17 | .28 | .10 | .15 |
| 8 | .03 | .00 | .03 | .12 | .06 | .18 | .12 | .26 | .14 | .02 | .09 | .07 | .06 |
| 9 | .05 | .00 | .05 | .15 | .08 | .41 | .34 | .14 | .85 | .41 | .43 | .16 | .30 |
| 10 | .05 | .00 | .05 | .16 | .06 | .42 | .17 | .02 | .41 | .76 | .40 | .22 | .28 |
| 11 | .05 | .00 | .05 | .20 | .08 | .51 | .28 | .09 | .43 | .40 | .60 | .21 | .37 |
| 12 | .01 | .00 | .01 | .06 | .02 | .28 | .10 | .07 | .16 | .22 | .21 | .49 | .16 |
| 13 | .06 | .00 | .02 | .18 | .03 | .35 | .15 | .06 | .30 | .28 | .37 | .16 | .51 |
| 14 | .00 | .00 | .01 | .02 | .01 | .13 | .04 | .03 | .10 | .12 | .09 | .25 | .07 |
| 15 | .00 | .00 | .05 | .16 | .08 | .22 | .17 | .16 | .30 | .18 | .29 | .25 | .33 |
| 16 | .00 | .00 | .04 | .12 | .05 | .48 | .24 | .16 | .40 | .27 | .34 | .21 | .31 |
| 17 | .00 | .00 | .05 | .14 | .07 | .51 | .18 | .18 | .48 | .41 | .41 | .17 | .39 |
| 18 | .00 | .00 | .04 | .08 | .05 | .38 | .15 | .08 | .29 | .28 | .25 | .01 | .30 |
| 19 | .00 | .00 | .03 | .00 | .00 | .23 | .02 | .03 | .08 | .07 | .06 | .06 | .22 |
| 20 | .00 | .00 | .00 | .00 | .00 | .30 | .26 | .11 | .52 | .24 | .25 | .15 | .23 |
| 21 | .00 | .00 | .00 | .00 | .00 | .08 | .02 | .02 | .06 | .09 | .06 | .19 | .05 |
| 22 | .00 | .00 | .00 | .00 | .00 | .20 | .06 | -.16 | -.08 | .15 | .06 | .04 | .11 |
| 23 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 24 | .00 | .00 | .00 | .00 | .00 | .04 | .01 | .01 | .03 | .05 | .03 | .10 | .02 |
| 25 | .00 | .00 | .00 | .00 | .00 | .14 | .03 | .02 | .09 | .15 | .09 | .29 | .07 |
| Σ | .47 | -0- | .61 | 2.30 | .97 | 6.31 | 3.47 | 1.82 | 5.64 | 5.01 | 5.20 | 3.51 | 4.57 |

TABLE XVIII
COVARIANCE MATRIX OF
JOHNSON-O'MALLEY INDIAN RESPONSES ON WISC
(Ages 11 & 12)

2-2

| | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 | 23 | 24 | 25 |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 3 | .01 | .05 | .04 | .05 | .04 | .03 | .00 | .00 | .00 | .00 | .00 | .00 |
| 4 | .02 | .16 | .12 | .14 | .08 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 5 | .01 | .08 | .05 | .07 | .05 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 6 | .13 | .22 | .48 | .51 | .38 | .23 | .30 | .08 | .20 | .00 | .04 | .14 |
| 7 | .04 | .17 | .24 | .18 | .15 | .02 | .26 | .02 | .06 | .00 | .01 | .03 |
| 8 | .03 | .16 | .16 | .18 | .08 | .03 | .11 | .02 | -.16 | .00 | .01 | .02 |
| 9 | .10 | .30 | .40 | .48 | .29 | .08 | .52 | .06 | -.08 | .00 | .03 | .09 |
| 10 | .12 | .18 | .27 | .41 | .28 | .07 | .24 | .09 | .15 | .00 | .05 | .15 |
| 11 | .09 | .29 | .34 | .41 | .25 | .06 | .25 | .06 | .06 | .00 | .03 | .09 |
| 12 | .25 | .25 | .21 | .17 | .01 | .06 | .15 | .19 | .04 | .00 | .10 | .29 |
| 13 | .07 | .33 | .31 | .39 | .30 | .22 | .23 | .05 | .11 | .00 | .02 | .07 |
| 14 | .28 | .12 | .14 | .05 | .09 | .12 | .05 | .21 | .08 | .00 | .11 | .34 |
| 15 | .12 | .86 | .32 | .35 | .15 | .04 | .14 | .08 | -.09 | .00 | .04 | .12 |
| 16 | .14 | .32 | .87 | .41 | .39 | .18 | .44 | .06 | .17 | .00 | .07 | .11 |
| 17 | .05 | .35 | .41 | .83 | .49 | .36 | .37 | .04 | -.03 | .00 | -.03 | -.00 |
| 18 | .09 | .15 | .39 | .49 | .66 | .29 | .26 | .08 | .31 | .00 | .00 | .09 |
| 19 | .12 | .04 | .18 | .36 | .29 | .84 | .07 | .05 | -.05 | .00 | .10 | .17 |
| 20 | .05 | .14 | .44 | .37 | .26 | .07 | .69 | .01 | .04 | .00 | .04 | .00 |
| 21 | .21 | .08 | .06 | .04 | .08 | .05 | .01 | .19 | .11 | .00 | .06 | .26 |
| 22 | .08 | -.09 | .17 | -.03 | .31 | -.05 | .04 | .11 | .57 | .00 | -.02 | .09 |
| 23 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 24 | .11 | .04 | .07 | -.03 | .00 | .10 | .04 | .06 | -.02 | .00 | .07 | .14 |
| 25 | .34 | .12 | .11 | -.00 | .09 | .17 | .00 | .26 | .09 | .00 | .14 | .42 |
| Σ | 2.46 | 4.32 | 5.78 | 5.83 | 4.72 | 2.97 | 4.17 | 1.72 | 1.56 | -0- | .87 | 2.62 |

$76.90 = S^2$, Matrix Total

TABLE XIX
JOHNSON-O'MALLEY INDIAN
NORMS RESPONSES OF WISC
(Ages 13 & 14)

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| V. | 64.48 | 309.49 | 17.59 |
| P. | 87.44 | 203.33 | 14.26 |
| FS. | 73.89 | 165.87 | 12,88 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| V. and P. | 0.37 |
| P. and FS. | 0.85 |
| V. and FS. | 0.73 |

TABLE XX
COVARIANCE MATRIX OF
JOHNSON-O'MALLEY INDIAN RESPONSES ON WISC
(Ages 13 & 14)

1-3

| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | .18 | -.00 | .15 | .15 | .18 | .14 | .12 | .07 | .11 |
| 2 | -.00 | .04 | -.00 | -.01 | -.00 | -.03 | .03 | .03 | -.03 |
| 3 | .15 | -.00 | .15 | .13 | .15 | .09 | .13 | .00 | .00 |
| 4 | .15 | -.01 | .13 | .54 | .15 | .26 | .29 | .15 | .13 |
| 5 | .18 | -.00 | .15 | .15 | .18 | .14 | .12 | .07 | .11 |
| 6 | .14 | -.03 | .09 | .26 | .14 | .93 | .09 | .14 | .74 |
| 7 | .12 | .03 | .13 | .29 | .12 | .09 | .28 | .10 | -.03 |
| 8 | .07 | .03 | .00 | .15 | .07 | .14 | .10 | .26 | .22 |
| 9 | .11 | -.03 | .00 | .13 | .11 | .74 | -.03 | .22 | .92 |
| 10 | .08 | .04 | .00 | .30 | .08 | .54 | .20 | .15 | .33 |
| 11 | .02 | -.03 | .00 | .15 | .02 | .64 | .05 | .13 | .63 |
| 12 | .03 | .02 | .00 | .12 | .03 | .31 | .10 | .01 | .13 |
| 13 | .05 | .02 | .00 | -.05 | .05 | .29 | .02 | .02 | .14 |
| 14 | .04 | .02 | .00 | .11 | .04 | .28 | .10 | -.03 | .05 |
| 15 | .11 | .05 | .00 | .34 | .11 | .43 | .17 | .17 | .17 |
| 16 | .06 | .03 | .00 | .19 | .06 | .48 | .05 | .05 | .25 |
| 17 | .09 | .04 | .00 | .17 | .09 | .44 | .12 | .18 | .34 |
| 18 | .08 | .04 | .00 | .25 | .08 | .24 | .16 | .16 | .16 |
| 19 | .00 | .00 | .00 | -.20 | .00 | .35 | -.21 | -.14 | .24 |
| 20 | .00 | .00 | .00 | -.13 | .00 | .36 | -.14 | -.09 | .28 |
| 21 | .00 | .00 | .00 | .00 | .00 | .21 | .06 | .06 | .25 |
| 22 | .00 | .00 | .00 | .00 | .00 | .12 | .04 | -.25 | -.20 |
| 23 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 24 | .00 | .00 | .00 | .00 | .00 | .13 | .07 | -.24 | -.23 |
| 25 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 26 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 27 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .30 | .56 |
| Σ | 1.66 | .26 | .80 | 3.04 | 1.66 | 7.32 | 1.92 | 1.52 | 5.27 |

TABLE XX
COVARIANCE MATRIX OF
JOHNSON-O'MALLEY INDIAN RESPONSES ON WISC
(Ages 13 & 14)

2-3

| | 10 | 11 | 12 | 13 | 14 | 15 | 16 | 17 | 18 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | .08 | .02 | .03 | .05 | .04 | .11 | .06 | .09 | .08 |
| 2 | .04 | -.03 | .02 | .02 | .02 | .05 | .03 | .04 | .04 |
| 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 4 | .30 | .15 | .12 | -.05 | .11 | .34 | .19 | .17 | .25 |
| 5 | .08 | .02 | .03 | .05 | .04 | .11 | .06 | .09 | .08 |
| 6 | .54 | .64 | .31 | .29 | .28 | .43 | .48 | .44 | .24 |
| 7 | .20 | .05 | .10 | .02 | .10 | .17 | .05 | .12 | .16 |
| 8 | .15 | .13 | .01 | .02 | -.03 | .17 | .05 | .18 | .16 |
| 9 | .33 | .63 | ,13 | .14 | .05 | .17 | ,25 | .34 | .16 |
| 10 | .76 | .37 | .26 | .29 | .21 | .48 | ,50 | .65 | .49 |
| 11 | .37 | .64 | .16 | .23 | .21 | .15 | .33 | .31 | .11 |
| 12 | .26 | .16 | .65 | .08 | .56 | .37 | .22 | .35 | .43 |
| 13 | .29 | .23 | .08 | .50 | .14 | .19 | .13 | .18 | .04 |
| 14 | .21 | .21 | .56 | .14 | .65 | .34 | .40 | .34 | .40 |
| 15 | .48 | .15 | .37 | .19 | .34 | .92 | .37 | .34 | .44 |
| 16 | .50 | .33 | .22 | .13 | .40 | .37 | .77 | .55 | .31 |
| 17 | .65 | .31 | .35 | .18 | .34 | .34 | .55 | .91 | .60 |
| 18 | .49 | .11 | .43 | .04 | .40 | .44 | .31 | .60 | .73 |
| 19 | .03 | .24 | .35 | -.02 | .48 | -.33 | .42 | .41 | .20 |
| 20 | .08 | .25 | .37 | -.19 | .38 | .36 | .43 | .29 | .18 |
| 21 | -.01 | .29 | .09 | .12 | .27 | .23 | .12 | .09 | .15 |
| 22 | .22 | .00 | .38 | .09 | ,46 | .14 | .31 | .07 | .12 |
| 23 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 24 | .39 | -.22 | .58 | -.17 | .39 | .24 | .16 | .22 | .33 |
| 25 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 26 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 27 | .00 | -.46 | .00 | -.82 | -.93 | .00 | -1.01 | .55 | .49 |
| Σ | 6.44 | 4.22 | 5.60 | 1.33 | 4.91 | 5.79 | 5.18 | 7.33 | 6.19 |

TABLE XX
COVARIANCE MATRIX OF
JOHNSON-O'MALLEY INDIAN RESPONSES ON WISC
(Ages 13 & 14)

3-3

| | 19 | 20 | 21 | 22 | 23 | 24 | 25 | 26 | 27 |
|---|---|---|---|---|---|---|---|---|---|
| 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 4 | -.20 | -.13 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 5 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 6 | .35 | .36 | .21 | .12 | .00 | .13 | .00 | .00 | .00 |
| 7 | -.21 | -.14 | .06 | .04 | .00 | .07 | .00 | .00 | .00 |
| 8 | -.14 | -.09 | .06 | -.25 | .00 | -.24 | .00 | .00 | .30 |
| 9 | .24 | .28 | .25 | -.20 | .00 | -.23 | .00 | .00 | .56 |
| 10 | .03 | .08 | -.01 | .22 | .00 | .39 | .00 | .00 | .00 |
| 11 | .24 | .25 | .29 | .00 | .00 | -.22 | .00 | .00 | -.46 |
| 12 | .35 | .37 | .09 | .38 | .00 | .58 | .00 | .00 | .00 |
| 13 | -.02 | -.19 | .12 | .09 | .00 | -.17 | .00 | .00 | -.82 |
| 14 | .48 | .38 | .27 | .46 | .00 | .39 | .00 | .00 | -.93 |
| 15 | -.33 | .36 | .23 | .14 | .00 | .24 | .00 | .00 | .00 |
| 16 | .42 | .43 | .12 | .31 | .00 | .16 | .00 | .00 | -1.01 |
| 17 | .41 | .29 | .09 | .07 | .00 | .22 | .00 | .00 | .55 |
| 18 | .20 | .18 | .15 | .12 | .00 | .33 | .00 | .00 | .49 |
| 19 | 1.06 | .26 | -.01 | .35 | .00 | .20 | .00 | .00 | -1.19 |
| 20 | .26 | .80 | .24 | .24 | .00 | .36 | .00 | .00 | .00 |
| 21 | -.01 | .24 | .40 | .02 | .00 | -.06 | .00 | .00 | -.36 |
| 22 | .35 | .24 | .02 | .53 | .00 | .50 | .00 | .00 | -.84 |
| 23 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 24 | .20 | .36 | -.06 | .50 | .00 | .77 | .00 | .00 | .00 |
| 25 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 26 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 27 | -1.19 | .00 | -.36 | -.84 | .00 | .00 | .00 | .00 | 1.33 |
| Σ | 2.49 | 4.33 | 2.16 | 2.30 | -0- | 3.42 | -0- | -0- | -2.38 |

$82.76 = S^2$, Matrix Total

TABLE XXI
JOHNSON-O'MALLEY INDIAN
NORMS RESPONSES OF WISC
(Ages 15, 16, & 17)

| | MEAN | VARIANCE | ST. DEV. |
|---|---|---|---|
| V. | 65.25 | 161.25 | 12.70 |
| P. | 86.58 | 121.18 | 11.01 |
| FS. | 73.08 | 119.36 | 10.93 |

COEFFICIENTS OF CORRELATION

| | |
|---|---|
| V. and P. | 0.44 |
| P. and FS. | 0.79 |
| V. and FS. | 0.90 |

TABLE XXII
COVARIANCE MATRIX OF
JOHNSON-O'MALLEY INDIAN RESPONSES ON WISC
(Ages 15, 16, 17)

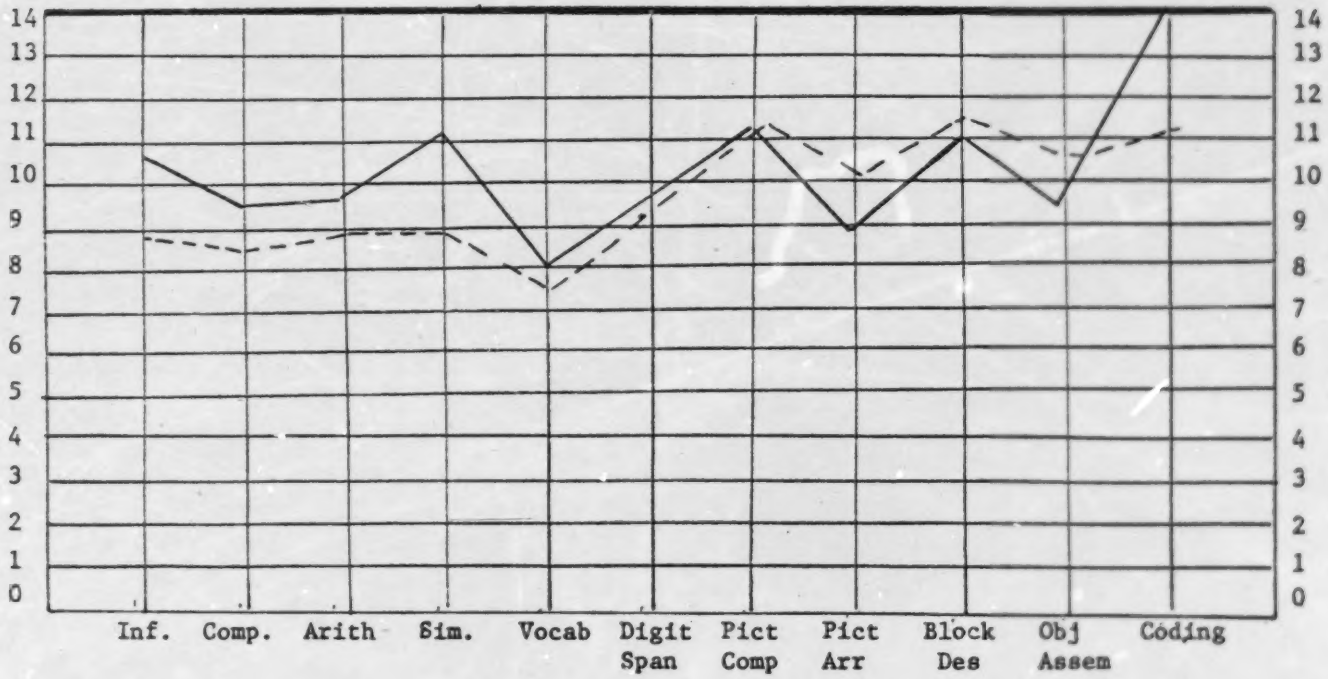


| | 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 | 11 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 4 | .00 | .00 | .00 | .24 | -.12 | -.06 | .12 | .21 | .39 | .21 | .27 |
| 5 | .00 | .00 | .00 | -.12 | .61 | .48 | -.24 | -.15 | -.33 | .21 | -.09 |
| 6 | .00 | .00 | .00 | -.06 | .48 | .79 | .24 | -.12 | -.12 | .42 | .18 |
| 7 | .00 | .00 | .00 | .12 | -.24 | .24 | .97 | .24 | .61 | .42 | .55 |
| 8 | .00 | .00 | .00 | .21 | -.15 | -.12 | .24 | .27 | .49 | .27 | .34 |
| 9 | .00 | .00 | .00 | .39 | -.33 | -.12 | .61 | .49 | .99 | .58 | .75 |
| 10 | .00 | .00 | .00 | .21 | .21 | .42 | .42 | .27 | .58 | .81 | .70 |
| 11 | .00 | .00 | .00 | .27 | -.09 | .18 | .55 | .34 | .75 | .70 | .75 |
| 12 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 13 | .00 | .00 | .00 | .23 | .37 | .35 | -.05 | .20 | .39 | .60 | .43 |
| 14 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 15 | .00 | .00 | .00 | .00 | .00 | .43 | .76 | .25 | .71 | .73 | .70 |
| 16 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 17 | .00 | .00 | .00 | .00 | .00 | .43 | .76 | .25 | .71 | .55 | .53 |
| 18 | .00 | .00 | .00 | .00 | .00 | .36 | .64 | .21 | .60 | .58 | .56 |
| 19 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | -.30 | -.29 |
| 20 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .60 | .58 |
| 21 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 22 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | -.64 | -.61 |
| Σ | -0- | -0- | -0- | 1.49 | .74 | 3.38 | 5.02 | 2.46 | 5.77 | 5.74 | 5.35 |

| | 12 | 13 | 14 | 15 | 16 | 17 | 18 | 19 | 20 | 21 | 22 |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 2 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 3 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 4 | .00 | .23 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 5 | .00 | .37 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 6 | .00 | .35 | .00 | .43 | .00 | .43 | .36 | .00 | .00 | .00 | .00 |
| 7 | .00 | -.05 | .00 | .76 | .00 | .76 | .64 | .00 | .00 | .00 | .00 |
| 8 | .00 | .20 | .00 | .25 | .00 | .25 | .21 | .00 | .00 | .00 | .00 |
| 9 | .00 | .39 | .00 | .71 | .00 | .71 | .60 | .00 | .00 | .00 | .00 |
| 10 | .00 | .6[illegible] | .00 | .73 | .00 | .55 | .58 | -.30 | .60 | .00 | -.64 |
| 11 | .00 | .43 | .00 | .70 | .00 | .53 | .56 | -.29 | .58 | .00 | -.61 |
| 12 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 13 | .00 | .77 | .00 | .64 | .00 | .96 | .80 | .88 | .58 | .00 | .00 |
| 14 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 15 | .00 | .64 | .00 | .80 | .00 | .80 | .80 | .52 | 1.03 | .00 | -.63 |
| 16 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 17 | .00 | .96 | .00 | .80 | .00 | 1.20 | 1.00 | 1.10 | .73 | .00 | .00 |
| 18 | .00 | .80 | .00 | .80 | .00 | 1.00 | .97 | .86 | 1.03 | .00 | -.70 |
| 19 | .00 | .88 | .00 | .52 | .00 | 1.10 | .86 | 1.00 | .67 | .00 | .00 |
| 20 | .00 | .58 | .00 | 1.03 | .00 | .73 | 1.03 | .67 | 1.33 | .00 | -.82 |
| 21 | .00 | .00 | .00 | .00 | ;00 | .00 | .00 | .00 | .00 | .00 | .00 |
| 22 | .00 | .00 | .00 | -.63 | .00 | .00 | -.70 | .00 | -.82 | .00 | .50 |
| Σ | -0- | 7.15 | -0- | 7.54 | -0- | 9.02 | 7.71 | 4.44 | 5.73 | -0- | -2.90 |

$68.55=S^2$, Matrix Total

Figure I
Mean WISC Sub-test Scores for Retarded and Non-Retarded (Indian) Readers

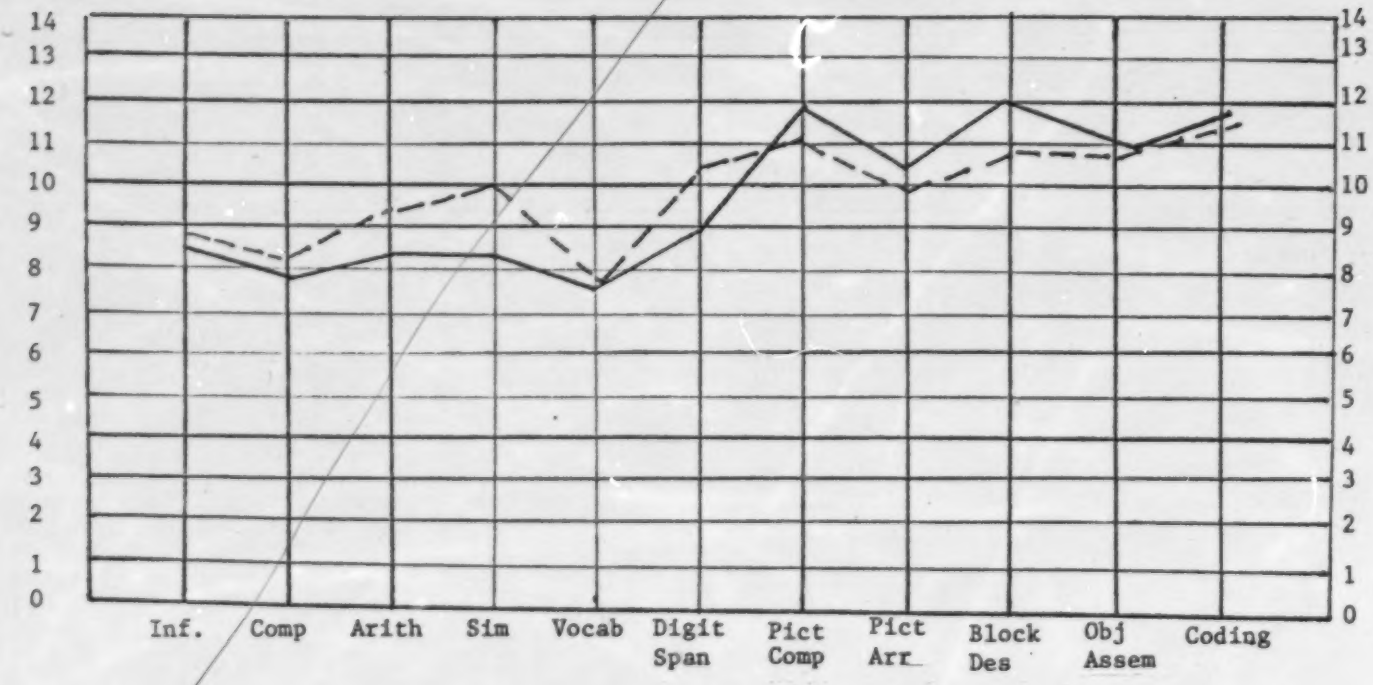



Code: Indian Retarded - - - - - -
Indian Non-Retarded_____

Source: ERIC Fiche #ED 057 931, p. 14. Hollingshead, Maybelle C., Clayton, Charles, 1972.

Figure II

Mean WISC Sub-test Scores for Male Retarded and Female Retarded (Indian) Readers




Code: Indian Male Retarded Readers _____
Indian Female Retarded Readers - - - -

Source: ERIC Fiche # ED 057 931, p. 14. Hollingshead, Maybelle C., & Clayton, Charles, 1972.

FIGURE III

WISC Profile for Grade 2

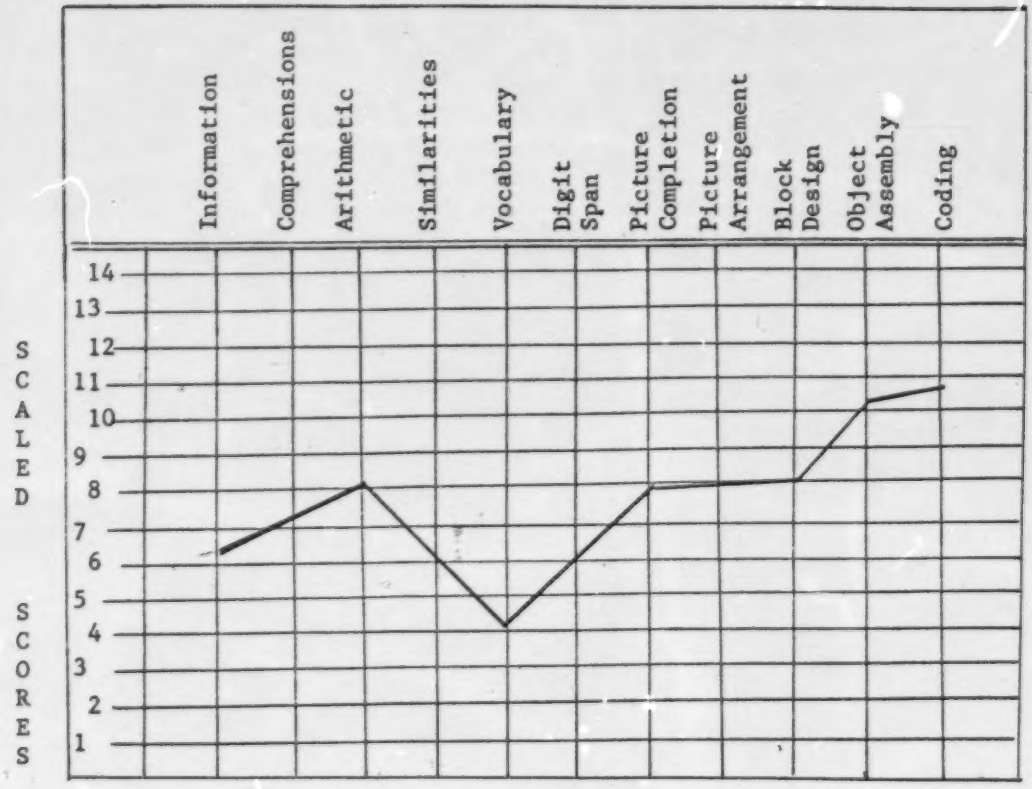


FIGURE IV

WISC Profile for Grade 3

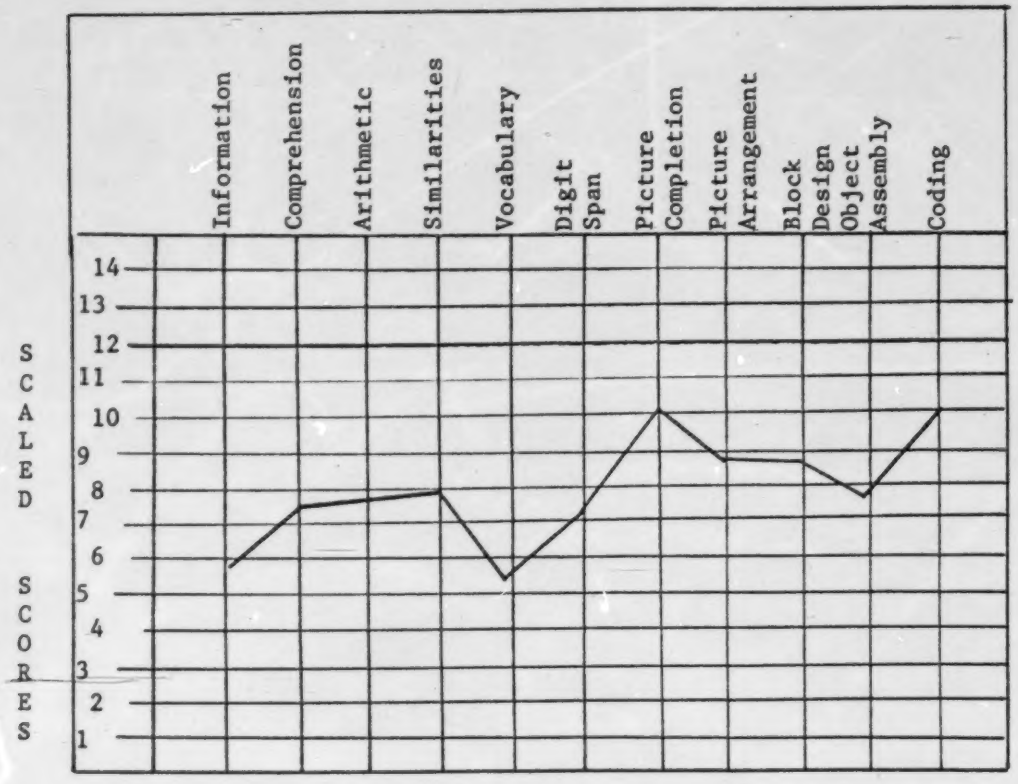


FIGURE V

WISC Profile for Grade 5

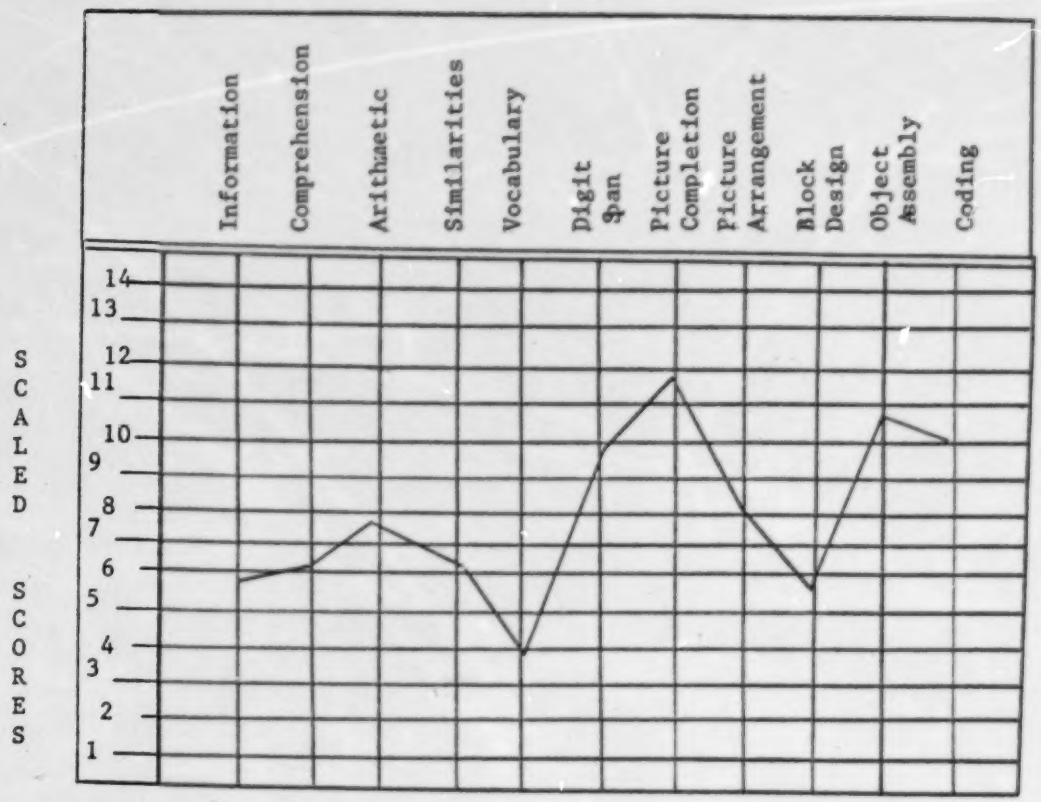


FIGURE VI

WISC Profile for Grade 6

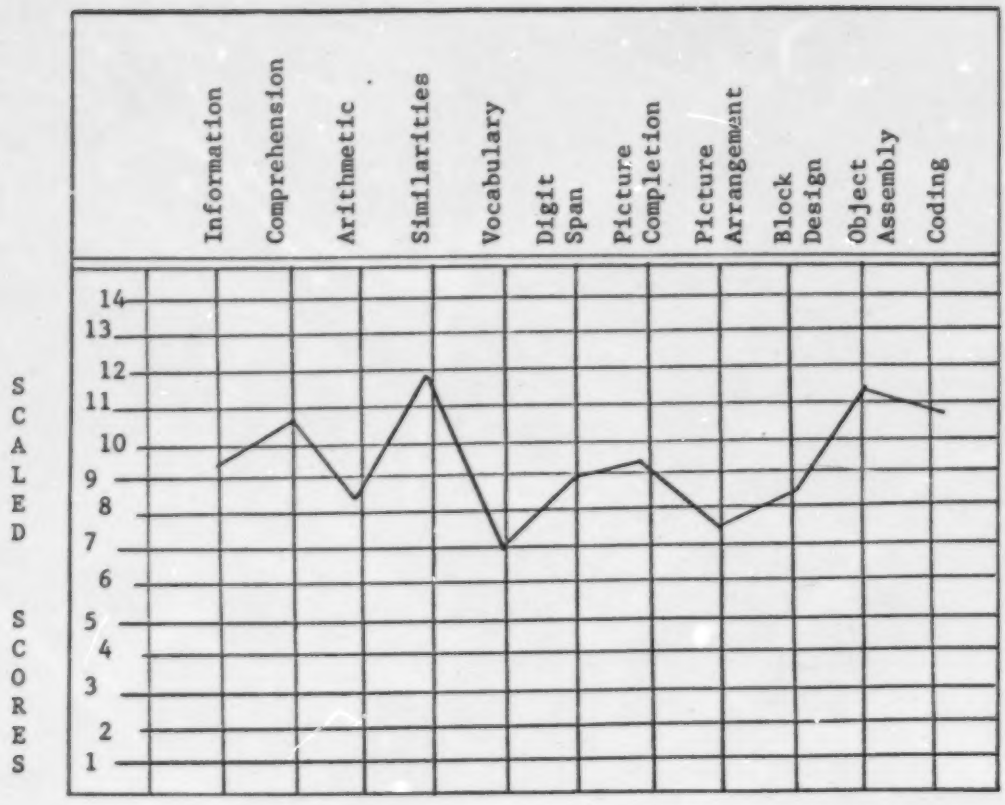
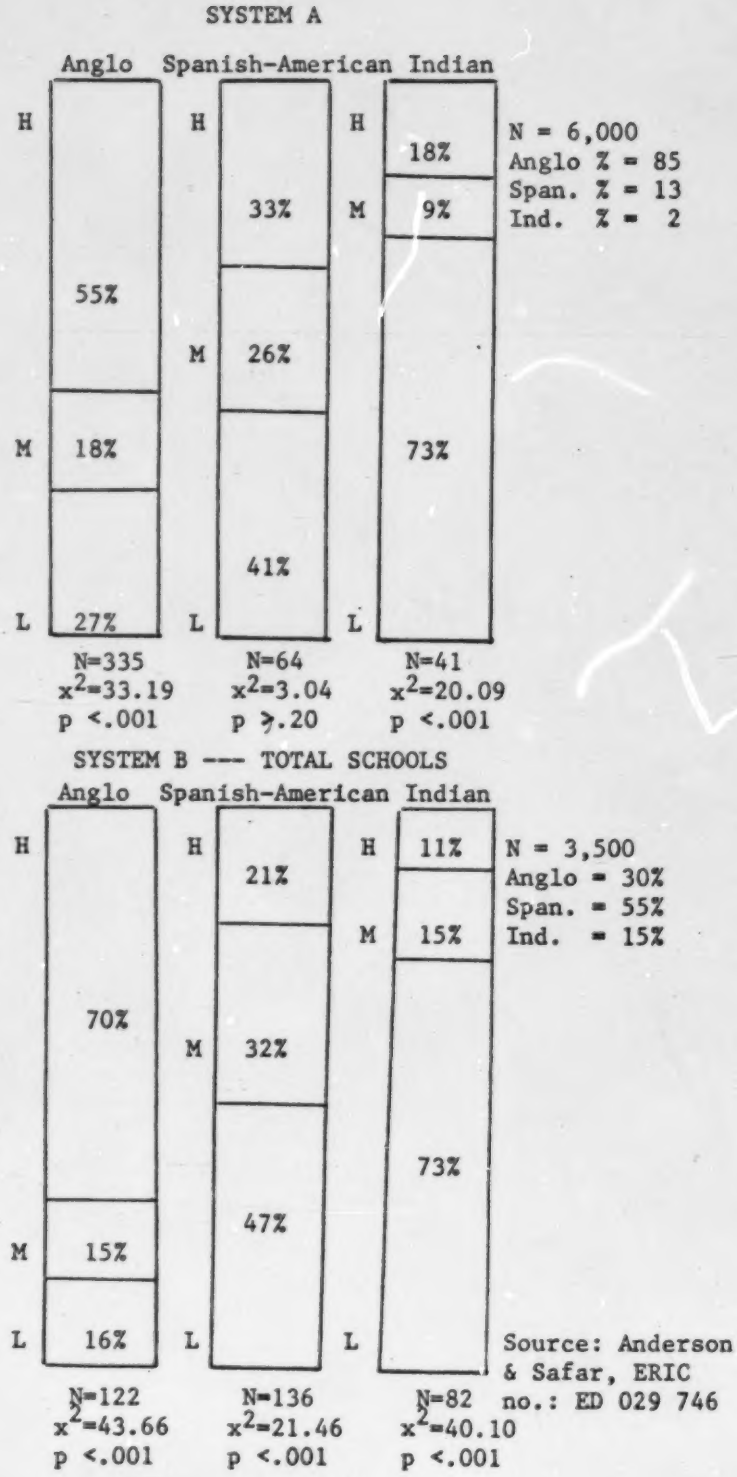


FIGURE VII

PUPIL ABILITY LEVELS FOR ANGLO, SPANISH-AMERICAN AND INDIAN PUPILS



Score

| | | |
|---|---|---|
| + | 1. orange | a color |
| + | 2. envelope | to put it in |
| + | 3. straw | to [illegible] |
| + | 4. puddle | |
| 0 | 5. tap | you tap letters, no response |
| 0 | 6. gown | |
| + | 7. roar | to scare people |
| + | 8. eyelash | you wear it (false) |
| 0 | 9. Mars | [illegible] |
| 0 | 10. juggler | [illegible] |
| 0 | 11. scorch | [illegible] |
| 0 | 12. lecture | [illegible] |
| 0 | 13. skill | [illegible] |
| 0 | 14. brunette | [illegible] |
| 0 | 15. muzzle | [illegible] |
| 0 | 16. haste | [illegible] |
| | 17. peculiarity | |
| | 18. priceless | |
| | 19. regard | |
| | 20. tolerate | |
| | 21. disproportionate | |
| | 22. lotus | |
| | 23. shrewd | |
| | 24. mosaic | |
| | 25. stave | |
| | 26. bewail | |
| | 27. ochre | |
| | 28. repose | |
| | 29. ambergris | |
| | 30. limpet | |
| | 31. frustrate | |
| | 32. flaunt | |
| | 33. incrustation | |
| | 34. retroactive | |
| | 35. philanthropy | |
| | 36. piscatorial | |
| | 37. milksop | |
| | 38. harpy | |
| | 39. depredation | |
| | 40. perfunctory | |
| | 41. achromatic | |
| | 42. casuistry | |
| | 43. homunculus | |
| | 44. sudorific | |
| | 45. parterre | |

Speaks Sp. at home - can't understand - talks well

Repeats and uses imag.

| Age Level | Score |
|---|---|
| VI | 6 |
| VIII | 8 |
| X | 11 |
| XII | 15 |
| XIV | 17 |
| AA | 20 |
| SA I | 23 |
| SA II | 26 |
| SA III | 30 |

| | Score 2 or 0 | 5. VOCABULARY WISC Page 49 |
|---|---|---|
| 1. Bicycle | 2 | |
| 2. Knife | 2 | |
| 3. Hat | 2 | |
| 4. Letter | 2 | |
| 5. Umbrella | 2 | |
| | Score 2, 1 or 0 | |
| 6. Cushion | 2 | |
| 7. Nail | 2 | |
| 8. Donkey | 2 | |
| 9. Fur | 2 | |
| 10. Diamond | 2 | a stone from ground very hard, used in making (very expensive) |
| 11. Join | 2 | put 2 th's toget. (ode are mare) |
| 12. Spade | 2 | turns up the ground |
| 13. Sword | 2 | weapon of metal used in mid. ages |
| 14. Nuisance | 2 | a bother |
| 15. Brave | 2 | person who can stand up to things |
| 16. Nonsense | 1 | silly |
| 17. Hero | 2 | person who does great th. |
| 18. Gamble | 2 | to bet money |
| 19. Nitroglycerine | 0 | can't remember |
| 20. Microscope | 1 | someth. that makes other th. look bigger |
| 21. Shilling | 2 | used as coin in Eng. |
| 22. Fable | 2 | story that's been passed down |
| 23. Belfry | 0 | city |
| 24. Espionage | 0 | Idk |
| 25. Stanza | 2 | one of the parts in a poem |
| 26. Seclude | 0 | Idk |
| 27. Spangle | 0 | Idk |
| 28. Hara-Kiri | 0 | Idk |
| 29. Recede | 0 | " |
| 30. Affliction | 0 | " |
| 31. Ballast | | |
| 32. Catacomb | | |
| 33. Imminent | | |
| 34. Mantis | | |
| 35. Vesper | | |
| 36. Aseptic | | |
| 37. Chattel | | |
| 38. Dilatory | | |
| 39. Flout | | |
| 40. Traduce | | |
| | 42 | |

some time.

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# APPENDICES

# Appendix A

Table 1. Annual School Census Report of Indian Children (continued)

Fiscal Year 1970

| Area / Agency | Total 5-18 Enumerated | TOTAL IN SCHOOL: Federal Schools1/ 5-18 | Federal Schools1/ Over 18 | Public Schools2/ 5-18 | Public Schools2/ Over 18 | Other Schools 5-18 | Other Schools Over 18 | TOTAL 5-18 | TOTAL Over 18 | Not in School 5-18 only | Unknown3/ 5-18 only |
|---|---|---|---|---|---|---|---|---|---|---|---|
| NAVAJO | 28,760 | 1,987 | 241 | 25,650 | 3 | 24 | 1,279 | 27,631 | 1,523 | 797 | 332 |
| Chinle | 3,[illegible] | 1,247 | 60 | 263 | 3 | 14 | 50 | 1,514 | 113 | 71 | - |
| Eastern, Tribe | 23,[illegible] | 716 | 181 | 24,745 | - | - | 1,164 | 23,461 | 1,345 | - | - |
| Other 7/ | 3,714 | 14 | - | 2,642 | - | 10 | 65 | 2,656 | 65 | 726 | 332 |
| PUEBLO | 55,181 | 11,942 | 1,222 | 24,232 | 770 | 2,731 | 963 | 48,905 | 2,955 | 5,757 | 519 |
| Arizona | 13,516 | 11,845 | 791 | 11,449 | 452 | 1,627 | 623 | 26,951 | 1,866 | 3,409 | 146 |
| New Mexico 8/ | 25,[illegible] | 7,078 | 361 | 11,826 | 290 | 1,013 | 321 | 19,967 | 992 | 2,143 | 352 |
| Utah | 2,203 | 939 | 50 | 887 | 28 | 91 | 19 | 1,977 | 97 | 205 | 21 |
| PUEBLOS | 17,776 | 4,108 | 442 | 10,473 | 125 | 2,250 | 722 | 16,941 | 1,289 | 738 | 97 |
| Colorado River | 1,012 | 47 | 16 | 959 | 4 | 6 | 53 | 1,012 | 73 | - | - |
| Fort Apache | 3,[illegible] | 544 | 35 | 1,916 | 36 | 449 | 88 | 2,839 | 159 | 111 | 37 |
| Hopi | 1,[illegible] | 1,259 | 81 | 475 | 9 | 134 | 129 | 1,968 | 219 | 29 | - |
| Navajo | 2,[illegible] | 125 | 67 | 1,675 | - | 20 | 126 | 1,820 | 193 | 122 | 58 |
| Papago | 2,[illegible] | 657 | 125 | 1,276 | 23 | 512 | 439 | 2,447 | 287 | 80 | - |
| Pima | 3,[illegible] | 629 | 34 | 1,357 | 17 | 356 | 75 | 2,342 | 126 | 327 | - |
| Salt River | 1,[illegible] | 354 | 39 | 672 | 19 | 155 | 14 | 1,141 | 63 | 28 | 2 |
| San Carlos | 2,[illegible] | 229 | 29 | 1,439 | 8 | 706 | 56 | 2,383 | 93 | 30 | - |
| Truxton Canyon | 395 | 143 | 20 | 252 | 1 | - | 20 | 395 | 41 | - | - |
| Window Rock and Carey | 565 | 24 | 5 | 529 | 8 | 10 | 22 | 554 | 35 | 11 | - |

Source: Statistics concerning Indian education; fiscal year 1970
Bureau of Indian Affairs (Department of Interior)
Washington D.C., (Ed 046 569)

## DIRECTORY
## BUREAU OF INDIAN AFFAIRS

**Aberdeen Area Office,** 820 So. Main St., Aberdeen, S.D. 57401

Cheyenne River Agency, Eagle Butte, S. Dak. 57625
Fort Berthold Agency, New Town, N. Dak. 58763
Ft. Totten Agency, Ft. Totten, N. Dak. 58335
Pierre Agency, Pierre, S. Dak. 57501
Pine Ridge Agency, Pine Ridge, S. Dak. 57770
Rosebud Agency, Rosebud, S. Dak. 57570
Yankton Agency, Wagner, S. Dak. 57380
Sisseton Agency, Sisseton, S. Dak. 57262
Standing Rock Agency, Ft. Yates, N. Dak. 58538
Turtle Mountain Agency, Belcourt, N. Dak. 58316
Winnebago Agency, Winnebago, Nebraska 68071

**Albuquerque Area Office,** P. O. Box 8327, Albuquerque, N. Mex. 87108

Consolidated Ute Agency, P.O. Box 315, Ignacio, Colo. 81137
Jicarilla Agency, Dulce, N. Mex. 87528
Mescalero Agency, Mescalero, N. Mex. 88340
United Pueblos Agency, P. O. Box 1667, Albuquerque, N. Mex. 87103
Zuni Agency, Zuni, N. Mex. 87327

**Anadarko Area Office,** Federal Building, Anadarko, Okla. 73005

Anadarko Agency, Anadarko, Okla. 73005
Concho Agency, Concho, Okla. 73022
Horton Agency, Horton, Kansas 66439
Pawnee Agency, Pawnee, Okla. 74058
Shawnee Agency, Shawnee, Okla. 74801

**Billings Area Office,** 316 No. 26th St., Billings, Montana 59101

Blackfeet Agency, Browning, Mont. 59417
Crow Agency, Crow Agency, Mont. 59022
Flathead Agency, Ronan, Mont. 59864
Fort Belknap Agency, Harlem, Mont. 59526
Fort Peck Agency, P. O. Box 637, Poplar, Mont. 59255
Northern Cheyenne Agency, Lame Deer, Mont. 59043
Rocky Boy's Agency, Box Elder, Mont. 59521
Wind River Agency, Ft. Washakie, Wyo. 82514

**Juneau Area Office,** Box 3-8000, Juneau, Alaska 99801

Southeast District Office, P. O. Box 3-8000, Juneau, Alaska 99801
Anchorage District Office, P. O. Box 120, Anchorage, Alaska 99501
Bethel District Office, P. O. Box 347, Bethel, Alaska 99559
Fairbanks District Office, P. O. Box 530, Fairbanks, Alaska 99701
Nome District Office, Nome, Alaska 99762

**Minneapolis Area Office,** 831 Second Avenue South, 2nd Floor, Minneapolis, Minn. 55402

Great Lakes Agency, Ashland, Wis. 54806
Minnesota Agency, Federal Bldg., P. O. Box 489, Bemidji, Minn. 56601
Red Lake Agency, Red Lake, Minn. 56671
Sac and Fox Area Field Office, Tama, Iowa 52339

**Muskogee Area Office,** Federal Bldg., Muskogee, Okla. 74401

Ardmore Agency, P. O. Box 997, Ardmore, Okla. 73401
Choctaw Agency, Philadelphia, Miss. 39350
Five Civilized Tribes Agency, Federal Bldg., Muskogee, Okla. 74401
Okmulgee Agency, P.O. Box 671, Okmulgee, Okla. 74447
Osage Agency, Pawhuska, Okla. 74056
Miami Agency, P.O. Box 391, Miami, Okla. 74354
Tahlequah Agency, P. O. Box 459, Tahlequah, Okla. 74464
Talihina Agency, P. O. Box 187, Talihina, Okla. 74571
Wewoka Agency, P. O. Box 1060, Wewoka, Okla. 74884

**Navajo Area Office,** P.O. Box 1060, Gallup, N. Mex. 87301

Chinle Agency, Chinle, Ariz. 86503
Eastern Navajo Agency, P. O. Box 328, Crownpoint, N. Mex. 87313
Fort Defiance Agency, Ft Defiance, Ariz. 86504
Shiprock Agency, Shiprock, N. Mex. 87420
Tuba City Agency, Tuba City, Ariz. 86045

**Phoenix Area Office,** P. O. Box 7007, Phoenix, Arizona 85011

Colorado River Agency, Parker, Ariz. 85344
Fort Apache Agency, Whiteriver, Ariz. 85941
Hopi Agency, Keams Canyon, Ariz. 86034
Nevada Agency, Stewart, Nev. 89437
Papago Agency, Sells, Ariz. 85634
Pima Agency, Sacaton, Ariz. 85247
Salt River Agency, Route 1, Box 907, Scottsdale, Ariz. 85251
San Carlos Agency, San Carlos, Ariz. 85550
Truxton Canyon Agency, Valentine, Ariz. 86437
Uintah and Ouray Agency, Ft. Duchesne, Utah 84026

**Portland Area Office,** 1425 NE Irving St., Box 3785,
Portland, Oregon 97208

Colville Agency, Coulee Dam, Wash. 99116
Fort Hall Agency, Ft. Hall, Idaho 83203
Northern Idaho Agency, Lapwai, Idaho 83540
Warm Springs Agency, Warm Springs, Oregon 97761
Umatilla Agency, Pendleton, Oregon 97801
Western Washington Agency, 3006 Colby Ave., Everett, Wash. 98201
Yakima Agency, Toppenish, Wash. 98948

**Sacramento Area Office,** 2800 Cottageway, Sacramento, Calif. 95825

California Agency, P. O. Box 4775, Sacramento, Calif. 95825
Hoopa Area Field Office, Hoopa, Calif. 95546
Palm Springs Office, 587 So. Palm Canyon Dr.,
Palm Springs, Calif. 92262
Riverside Area Field Office, 6848 Magnolia Ave., Suite 8,
Riverside Calif. 92506

**Field Offices Under Central Office,** Washington, D. C. 20242

Cherokee Agency, Cherokee, N. Carolina 28719
Miccosukee Agency, P. O. Box 1369, Homestead, Fla. 33030
Seminole Agency, 6075 Stirling Road, Hollywood, Fla. 33024

# ADDENDA

Research Proposal
Submitted to the National Institute of Education
(Title of NIE activity to which submitted)

Title of Project: Item Analyses of Amerindian and Chicano Responses on the Vocabulary Scales of the Stanford-Binet LM and Wechsler Batteries

Applicant Institution: MISSOURI SOUTHERN STATE COLLEGE
JOPLIN, MISSOURI 64801

Principal Investigator: (Full name, title, address and telephone number of the individual who will direct the study)
CLYDE I. WILLIAMS, Ed.D.
HEAD, DEPARTMENT OF PSYCHOLOGY
MISSOURI SOUTHERN STATE COLLEGE
JOPLIN, MISSOURI 64801 (417) 624-8100 (ext. 225)

Co-investigator (if any)

Transmitter: (Full name, title, address and telephone number of the individual empowered to commit the institution to the activity)
DR. PAUL SHIPMAN
ADMINISTRATIVE ASSISTANT TO THE PRESIDENT
MISSOURI SOUTHERN STATE COLLEGE
JOPLIN, MISSOURI 64801

Proposed Project Duration: From January 1, 1974 To May 31, 1974

Total Federal Funds Requested: $9,153.88

Date Submitted: March 1, 1973

Technical data contained in pages _____ of proposal shall not be used or disclosed, except for evaluation purposes: Provided, That if a grant or contract is awarded to this submittor as a result of or in connection with the submission of this proposal, the Government shall have the right to use or disclose this technical data to the extent provided in the award. This restriction does not limit the Government's right to use or disclose any technical data obtained from another source without restriction.

Project Budget Summary

(Federal Support Only)

Project Director CLARK I. GUILLIAMS, ED.D. Institution HEAD, DEPARTMENT OF PSYCHOLOGY
MISSOURI SOUTHERN STATE COLLEGE
JOPLIN, MISSOURI 64801

Time Period: From JANUARY 1, 1974 To MAY 31, 1974

A. Direct Costs:

| | |
|---|---|
| Personnel Salaries: | $ 7,500.00 |
| Employee Benefits: 8% Mo. State Retirement(600.00), MSTA Health insur.(6 mo's @ 11.48/mo.=$68.88) | $ 668.88 |
| Travel: 3,000 miles @ .10¢/mi(no request being made for per diem food/housing; director considers included in his salary). | $ 300.00 |
| Supplies and Materials: | $ |
| Communications: L.D. telephone & postage | $ 50.00 |
| Services: | |
| Duplicating and Reproducing(photocop.1000 Vocab. sheets) | $ 50.00 |
| Statistical: IBM 370 Comp. time, Sch.of the Ozarks, Pt.-Lookout, Mo. | $ 400.00 |
| Other (explain)Clerical: test protocol / retrieval from sch. cum. records. | $ 160.00 |
| Final Report Production: Director will type rough drafts until submit. to sec. | $ 25.00 |
| Equipment: | $ |
| Other Direct Costs: (explain) | $ |
| Subtotal, Direct Costs | $ 9,153.88 |
| B. Indirect Costs<br>Indicate the basis for calculating indirect costs | $ |
| C. Total Costs (Federal Support) | $ 9,153.88 |

Notes: 1. Use one sheet for each 12-month period and a summary sheet for totals.

2. Consultants: Show fees under personnel, transportation and per diem under travel.

A. Direct Costs

Personnel Salaries: $ 7,500.00

Project Director's salary for second semester would be one/half $15,194 (nine mo. contract, excluded evening division and Summer session salary at MSSC, Joplin, Mo.

Director will take a leave of absence for the second semester, academic year 1973-74; thus, one-hundred per-cent of his time will be devoted to the project proposed.

Employee Benefits: 668.88

Eight per-cent of project director's salary withheld, and eight per-cent is matched by institution (MSSC) for the Mo. State Retirement System: therefore, 8% of $7,500.00 would be $600.00. The monthly withholding for MSTA Health Insurance is 11.48/mo. (Jan. 1974 - May 1974; six mo's - 68.88).

Travel: 300.00

Miles traveled by car - approx. 3,000; @ .10¢/mi. = $300. The project director is making no request for per diem food/housing; holds the latter included in salary above.

Supplies and Materials: .00

No materials requested, other than paper, which will be furnished by director's institution at no cost.

Communications: 50.00

Telephone: estimated L. D. calls at $40.00. Director's institution has absorbed approximately $50.00 already, at no cost to project, in calls to research sites in Oklahoma, Kansas, New Mexico, and Arizona; and approximately $10.00 postage.

Services: 50.00

Duplicating & Reproducing: Photocopying of 1,000 vocabulary subtests protocols from WPPSI, WISC or Stanford-Binet intelligence tests, at approximately .05¢/copy = $50.00.

Statistical: IBM computer time for producing covariance-matrices and multiple-linear regression analyses; N=1,000; up to 45 items by CA, MA Sex, Urban-Rural, ethnic grouping, Verbal-performance, and Full Scale IQ criteria = $400.00. Service will be provided by The School of the Ozarks-Computer Center, Point Lookout, Missouri (Chief Computer: Mr. Robert Carpenter). The bid from the director's home institution (MSSC) was $600.00; primarily, because of longer computer time required with an IBM 1130. 400.00

Other: 160.00

Clerical help needed for the retrieval of test protocols from participating schools, cumulative record files, at approximately $160.00. Anticipate at least 100 hours of assistance needed from local site paraprofessional personnel, at approximately $1.60/hour.

Final Report Production:
The director will do all of the typing of rough drafts, table figure preparation, until the final draft of the project is ready to be typed. This cost for final draft is estimated at $25.00 at .20¢/page for approximately 125 pages. $ 25.00

Equipment:
None requested

Other Direct Costs:
None anticipated $ - 0 -

Subtotal, Direct Costs $9,153.88

B. Indirect Costs:
None, as principle investigator will not be using home institution facilities, except to allocate salary and other costs check. The director's institution (MSSC) has not asked for payment for these minor business office transaction.

C. Total Costs (Federal Support): $9,153.88